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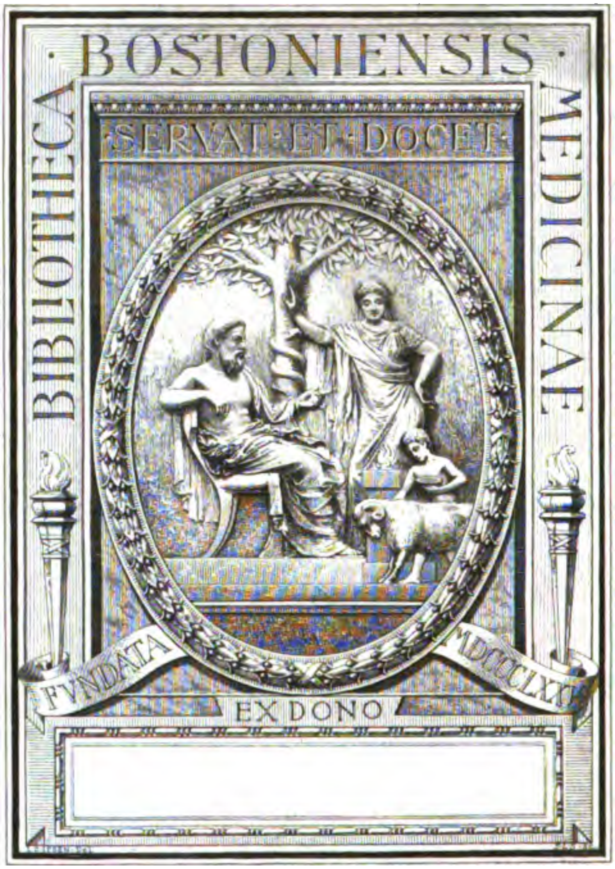
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PEDIATRICS

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ORIGINAL ARTICLES

SUMMER DIARRHEAL MORTALITY IN LONDON*

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Any inquiry into summer diarrheal mortality in London must take account of the deaths registered as due to enteritis and gastroenteritis, as well as of those referred simply to diarrhea and cholera. In a short paper by the author, published in the *British Medical Journal* of May 28, 1898, attention was drawn to the significance of enteritis in the metropolitan returns, and reasons were given for the view that a very large majority of the deaths registered as due to enteritis should be transferred to the "diarrhea" column. The average seasonsal mortality-curve of enteritis in London was shown to be almost identical with that of diarrhea, the almost simultaneous rise of the two curves at the end of June, the simultaneous attainment of the maximum of each at the end of July, and the rapid fall of each curve throughout August and September presenting features of almost complete harmony throughout their course. Taking the twelve years 1891-1902, 77 per cent. of the deaths from diarrhea and cholera have occurred, on an average, in the third quarter of the year, and 60 per cent. of the deaths from enteritis have so occurred. Again, the age-incidence of diarrhea and enteritis on the population is very similar. In the same period (1891-1902) 91 per cent. of the deaths from diarrhea and cholera have been of children under five years of age, whilst 78 per cent. of the deaths from enteritis have been under five.

In each of the years 1891, 1892, and 1893, 30 deaths from enteritis and gastro-enteritis were registered for every 100 deaths from diarrhea and cholera. In 1894 there were 51 due to enteritis to every 100 due to diarrhea; in 1895, 40; in 1896, 51; in 1897, 52; in 1898, 55; in 1899, 73; in 1900, 58; in 1901, 36; and in 1902, 37. For the first three quarters of 1903 there have been 28 deaths from enteritis registered for every 100 due to diarrhea and cholera. It is evident, then, that from 1893 to 1899 "enteritis" registration was increasing; since 1899 there has been a decrease in the use of the term enteritis as a cause of death. This decrease dates from the action of the Superintendent of Statistics in the Registrar-General's office in calling attention to the unsuitability of the terms enteritis and gastro-enteritis for the registration of deaths from what is in reality summer diarrhea, and suggesting the use of other terms, more especially "zymotic enteritis," which now enable these deaths to be recorded under the "diarrhea" column.

In the following table, which shows the relations subsisting in each of the years 1891-1903 between diarrheal mortality in London in the summer months, and the average temperatures and rainfalls of those months, deaths from enteritis and gastro-enteritis have been included with those due to diarrhea and cholera. Some of the deaths from enteritis of persons over five years of age are probably due to disease essentially different from summer diarrhea; but these form so small a proportion of the whole in the summer months that there is much less error to be feared from their inclusion than would arise from the exclusion of enteritis in a general survey of summer diarrheal mortality.

An examination of the table shows that the June mortality from diarrheal diseases in London is not heavy. The sudden upward rise in the seasonal mortality-curve does not, as a rule, take place until the 25th or 26th week of the year, that is to say, in the last week or ten days of June. The mean temperature of this month (average of 1891-1903) is 59-6° F. The year 1893 is seen to be exceptional. In this year the curve began to rise at the end of May or very early in June, and the mortality for the month of June was more than three times in excess of the average. The May of 1893 was warmer than any May of the thirteen years (1891-1903), the mean temperature being 57.7°, as against an average of 52.8°, and the rainfall of 0.53 inch. was also very deficient. The June of 1893 was also warm (mean temperature 61.8°), and its rainfall 0.82 inch—a small one. The warm and dry months of May and June in 1893 corresponded with an unusually early rise in the summer diarrheal mortality in that year.

The years 1894 and 1902 were characterized by cold Mays and Junes, and their diarrheal mortalities were much below the average. The years 1895 and 1896 had warm Mays and Junes, and in 1895 the rainfall of these two months was exceptionally small. In each of these years the June diarrheal mortality was slightly over the average, but nothing approaching the mortality of June, 1893. It is evident, therefore, that, whilst a warm May and June tend to produce an early rise in the diarrheal mortality-curve, there is no such direct correspondence as would lead to the belief that a high air-temperature in these months is the only factor concerned in initiating a high prevalence of diarrhea.

The mortality-figures for July and August have been taken together, as it is impossible to separate out in the Registrar-General's returns the exact figures for each month. They really represent the mortalities accruing in the 27th to the 35th weeks of the year.

The years of maximum mortality in July and August (1897 and 1899) are characterized by mean temperatures in July and August above the average. But here again there is no proportional correspondence between high temperature and heavy mortality, otherwise the mortality in July and August, 1893, should much more nearly correspond with those of 1897 and 1899 than it does. As a matter of fact, it was less than half that of either of these two years; but the temperature-records of July and August, 1893, are very similar to those of 1897 and 1899; and on inspection of these figures alone one might have anticipated a mortality in July and August, 1893, not far short of those displayed in July and August of either 1897 or 1899. The year 1900 showed an exceptional behavior of diarrhea prevalence. The July temperature of 66.8° F. is the highest recorded for the series of years; but the July mortality was low until the fourth week of the month. A heavy mortality prevailed throughout August and September, notwithstanding that these months were comparatively cool. In 1902 the July and August mortality was only about one-third of the average of these months. In this year July and August were cold, inclement months, but not apparently worse in this respect

DEATHS IN LONDON FROM DIARRHŒA AND ENTERITIS, 1891-1903.

	Deaths.					Mean Temperatures.						Rain-fall.						
Year	June	July & Aug.	Sept.	Oct.	Five Mos. June to Oct.	May	June	July	Aug.	Sept.	Oct.	May	June	July	Aug.	Sept.	Oct.	Total Six Mos.
1891	138	1,709	394	256	2,497	50.3	60.4	60.3	58.6	59.1	50.9	2.69	0.96	3.39	3.72	0.82	4.32	15.90
1892	228	1,678	482	178	2,566	55.2	58.1	59.6	61.7	56.3	45.4	1.66	2.27	1.54	3.03	2.01	3.88	14.39
1893	729	2,252	592	242	3,815	57.7	61.8	63.1	65.5	57.1	51.5	0.53	0.82	3.33	1.25	1.29	4.16	11.38
1894	96	1,349	348	169	1,962	50.3	58.6	62.0	59.6	54.1	50.2	1.52	2.04	3.26	3.03	1.25	3.99	15.09
1895	247	2,966	624	418	4,255	56.0	61.4	62.6	62.2	62.2	46.5	0.45	0.21	3.89	2.14	0.93	2.69	10.31
1896	277	3,403	360	191	4.231	54.8	63.4	65.2	59.2	56.7	46.5	0.27	1.94	1.07	2.06	5.54	2.80	13.68
1897	176	4,660	510	201	5,547	52.3	61.1	64.5	62.9	55.2	51.0	1.25	1.93	0.73	2.86	2.70	0.48	9.95
1898	135	3,185	2,112	606	6,038	51.7	57.6	61.5	64.6	62.1	53.8	2.64	1.75	1.34	0.86	0.31	3.15	10.05
1899	150	4,699	1,390	326	6,565	50.9	60.7	65.7	65.7	57.7	49.1	1.65	0.76	1.74	0.35	2.23	2.34	9.07
1900	146	3,097	1,013	450	4,706	51.6	59.5	66.8	60.6	57.9	51.1	1.37	2.82	1.41	2.03	1.14	1.55	10.32
1901	163	3.055	875	345	4,438	53.2	58.8	64.8	62.3	57.9	50.5	1.79	1.49	1.72	1.03	1.35	2.60	10.98
1902	95	897	1,110	470	2,572	48.4	57.6	61.1	60.6	56.6	49.8	3.33	3.10	1.09	2.93	1.65	1.24	13.34
1903	133	1,246	837	507	2,723	53.6	55.8	62.1	60.1	56.6	51.9	1.95	6.07	5.27	5.66	1.39	4.43	24.77
Av'ge 1891-1903	209	2,630	819	335	3.993	52.8	59.6	63.0	61.8	57.7	49.9	1.62	2.01	2.29	2.46	1.74	2.89	13.02

than in the years 1891 and 1892, when the July and August mortalities were about double that of 1902.

There is, therefore, some factor apart from temperature which exerts a very considerable influence on the seasonal prevalence of diarrhea. This factor is apparently not rainfall. A consideration of the rainfall records for the summer months of 1891-1903 seems merely to suggest that rainfall *per se* is not a disturbing factor, apart from the fact that high summer temperatures are usually noted in periods of deficient rainfall. A fine, hot summer is usually a dry summer; but excess or deficiency of rainfall, considered apart from temperature, does not appear to be influential in affecting diarrheal prevalence and mortality. The diarrhea mortality of the third quarter of the present year, 1903, has been low, but it is slightly higher than the mortality for the corresponding period in 1902. The temperatures of the two seasons have been very similar, but whereas the rainfall of the third quarter of 1902 was only 5.67 inches, that of 1903 was 12.32 inches. If excessive rainfall tended to induce low diarrhea-prevalence, then the diarrhea of the present season ought to have been much below that of 1902.

The September mortality shows the decline of the seasonal prevalence of diarrhea. Prior to 1898 the decline appears to have been a rapid one each year, with the exception of 1895. In this year the mean temperature of September (62.2° F.) equalled that of August, and high diarrhea-prevalence continued well on into the fourth quarter of the year. In 1898, also, September (62.1°) was warmer than July (61.5°), and the diarrhea-prevalence was relatively very high in September and October. In 1899, however, the September temperature was equal to the average, and the diarrhea-mortality fell very sharply during this month, although the July and August mortality was the heaviest recorded. In 1900, in 1901, and in 1902, diarrhea-prevalence was continued for some unexplained reason, until the end of October, although the September temperatures hardly departed from the average. The year 1902 was very exceptional as regards the behavior of diarrhea. The September mortality was greater than that of July and August taken together, owing to the lateness of the onset of epidemic prevalence, but September was a cold month, the mean temperature being only 56.6°, as against an average of 57.7°.

As for the rise, so for the decline in diarrhea mortality, temperature appears to exert a certain influence, but there are other factors operating, which in certain seasons tend to mask its influence. What these other factors are is not at present known. Infectivity might be thought of as controlling the decline of an epidemic. If the disease is in any way infectious, then the existence of a very large number of infecting centres would tend to perpetuate the epidemic; and the decline, notwithstanding a lowered temperature, would be very much more gradual than it is. The facts hardly warrant the assumption of any high degree, at any rate, of infectivity; as, if this were so, the late autumn prevalence would be greatest and most prolonged in those years in which the summer prevalence has been highest. But this is not the case as the table clearly shows. It must be remembered, however, that we are only dealing with mortality and not with actual prevalence, as the cases that end in recovery are unrecorded; and it may possibly happen that different epidemics have different fatality rates; and that prevalence is not always to be measured by mortality.

The substance that sets up summer diarrhea is now generally believed to be introduced into the human body by means of the food. Of the London deaths from diarrhea and cholera from 1891-1902, 91 per cent. were of children under five, and 77 per cent. were of infants under one year. Of the deaths due to enteritis and gastro-enteritis for a similar period, 78 per cent. were under five and 65 per cent. were under one year. The incidence of the disease, therefore, so far as its fatal effects are seen, is chiefly upon infants and young children. As milk forms the principal food at this early period of life, it would seem probable that it is in this fluid for the most part that the substance is conveyed to the alimentary tract, which ultimately sets up an irritative diarrhea. The substance so present in milk, whether it be a bacillus with its toxins, or a ferment, is evidently largely dependent upon air-temperature and some other unknown factors, for its subsequent capacity to set up gastro-intestinal changes when introduced into the alimentary tract. In the absence of a sufficiently high air-temperature the poison, although present in the milk, appears to be inoperative. Whether this poison is present in the milk as supplied by the retail milk-vendor, or whether it is in the homes of the poor that the milk receives a contamination not heretofore present, are questions not altogether solved. What, however, we do see is that Nature by sending us warm and cold summer season demonstrates on a large scale that diarrhea mortality is very largely a matter of temperature; and our scientific reasoning enables us to realize that a process so largely dependent upon temperature must have relation with some organized ferment or bacterium whose habitat is food, this being the vehicle for the introduction of the *materies morbi* into the human body.

The most hopeful methods, therefore, of counteracting the diarrheal poison would appear to be the sanitary control and supervision of all milk supplies, and the education of the mothers of the children to an appreciation of the necessity for domestic cleanliness and for the careful and cleanly preparation of the children's food.

EARLY SYMPTOMS OF DEMENTIA PRECOX*

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Dementia præcox is one of the most prominent forms of mental disease, constituting over 25 per cent. of the insane of Connecticut, committed to the State Hospital during the past four years. It should also be of the greatest interest to the general practitioner because of the gradual and often insidious character of its onset, which places its subjects in his hands long before necessity seems to demand the care of a hospital. During this period the disease is often unrecognized and untreated.

It is essentially a disease of youth and early adult life, and is characterized by a progressive mental deterioration leading to dementia of different grades, varying from a very moderate degree to the most profound. The disease process when well established is usually recognized without difficulty. At this time hallucinations of hearing are especially prominent, consciousness is usually not clouded, although most patients do show some difficulty in comprehension. The power of attention is undermined by an increasing lack of interest. Memory shows a progressive impairment. The store of ideas becomes more and more scanty, and thought more limited. Judgment is defective, as shown by the presence of delusions, which at the beginning are more often of a depressing nature, but later may become expansive. These disturbances of the intellectual side of the mental life are usually accompanied by emotional deterioration—emotional apathy and indifference. Temporarily there may be considerable despondency or exhilaration, as well as irritability, when hallucinations and delusions are very numerous, but the fundamental alteration is a progressive emotional indifference. Volition becomes gradually paralyzed, and we find the patients exhibiting an increasing lack of energy. They are sluggish and listless. Transiently, there may appear restlessness or agitation, and even considerable motor

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*Read at the annual meeting of the Connecticut Medical Society, Hartford. By Courtesy of the *Medical Record.*

excitement, also peculiarly modified movements called mannerisms. Catalepsy and negativism may occur, but here also the basic change is an increasing anergia.

This, in a general way, characterizes the disease picture of dementia præcox, but clinically the cases appear in one of three groups, the hebephrenic, the catatonic, and the paranoid. The peculiar symptoms constituting these various forms will not be discussed here, but our observations will be limited to the early symptoms which are practically the same for all of these different forms.

These early symptoms may be conveniently grouped into four different classes, namely, cases in which there is simple mental deterioration without hallucinations or delusions, cases in which a few indefinite delusions appear, cases of a neurasthenic character, and finally those of an hysteroid character. These can be best demonstrated by illustrative cases.

Simple Mental Deterioration without Hallucinations or Delusions.—The first patient is a young man of excellent family history. He developed normally as a boy and was of a cheerful, happy disposition. He was a good student and graduated with honors from high school. Nothing of an unusual character was noted until after his graduation, when a change in disposition came over him. At this time he failed to show any interest in the further pursuit of his education, or in adopting a profession. Instead he remained about home and, contrary to his usual custom, did not even aid his parents in the farm duties. Pampered by his mother, he was allowed to devote his time to social life, of which he had always been very fond, but in the course of six months he wearied of this and began to drop his friends. He remained at home, secluded himself in his room much of the time, occasionally reading pictorial newspapers, but more often sitting unoccupied in a sort of dreamy mood. Formerly his wearing apparel and his personal appearance had been matters of great pride with him, but now he became careless in these respects, and went about with disheveled hair and unpolished boots. Social obligations and church relations no longer interested him. Acquaintances and strangers calling at the house were avoided. Later financial difficulties of his father, and subsequent fatal illness, did not arouse him to a sense of responsibility. He no longer read, and never volunteered conversation, while his answers to questions were monosyllabic, clearly indicating his total disinterest in what was transpiring about him. Some months later, when thrown upon the charity of his sister at the death of his father, he could not be induced to do any sort of work. When urged he usually became irritable, and retaliated by saying he would show them that he did not have to work. Most of his time was spent sitting behind the kitchen stove. He showed absolutely no interest in the affairs of the household; occasionally when sent to the shed for wood, he would be found half an hour later standing idly against the side of the building. During the succeeding six months he became more careless of his appearance; refused to bathe, to have his hair cut, and at times to remove his clothing upon retiring at night. At this time the patient was committed to our care, when it was ascertained that the disease was already far advanced. The memory for both recent and remote events was greatly impaired, judgment was weak, emotional deterioration extreme, and paralysis of the will-power marked.

This is a case of dementia præcox in which the onset was most insidious, and the course was progressive, leading to dementia before friends and acquaintances were aware of the existence of any disease process, or of the necessity of medical consultation and treatment. Because of the absence of hallucinations and delusions, the ***sine quá non*** of mental disease in the minds of most practitioners, cases of this sort are progressing to dementia in many communities of the State unrecognized and untreated. A considerable number of the so-called professional tramps as well as alcoholics, are really individuals suffering from this disease, destined sooner or later to reach the insane hospital.

Cases with a Few Indefinite Delusions.—The second class of cases is characterized by a gradual development of dementia accompanied by a few indefinite delusions, and is illustrated by the following case: This patient is a well-developed girl, whose grandmother had been insane. In early childhood she had had scarlet fever, with an abscess on her neck, followed by double otitis media purulenta, which still persists. Menstruation began at eleven years, had usually been excessive, but at times, from fourteen years, very scanty. Her teachers claimed that she was backward in her studies, but applied herself well to her work. In disposition she was quiet and bashful.

At sixteen it became evident to her parents that she was undergoing a change in disposition. She became more reserved, and preferred remaining alone in her room while studying evenings. She lost weight, seemed languid and had no relish for food. She confessed to her mother that she was worrying greatly about a leucorrheal discharge. She thought that it was a bad disease, that her teacher also had it and had gotten it from her. Because of her physical condition it seemed best for her to remain out of school for the remaining two months of the school year. This change was immediately beneficial and she improved in weight and appetite, and appeared less reserved. But still her former energy was lacking and she failed to show her usual interest in the household duties. In the fall she could not be induced to return to school, as she felt that the teachers and scholars had turned against her. About this time she would often return from the neighbors, saying that she thought they had acted strangely toward her and did not want her to call on them. She was aware that a change was coming over her, and said that she longed to experience religion and wanted to be good, but something seemed to prevent her. She cried a good deal, especially when attending church. She tried to pray but could not. Conscious of her peculiar actions she wanted to unburden her heart to her mother, but felt as if she could not. Her attitude was one of despondency, and she became more seclusive and reticent. Physically, nutrition became impaired, the weight fell, constipation and anorexia appeared. In the course of three more months irritability and a tendency to impulsive actions developed. Once she threw dishes upon the floor, at another time a lamp, and finally broke out window panes without other reason than that she felt like it. These acts led to her commitment to the hospital. It is unnecessary to follow through her history at the hospital, where further symptoms of the disease have developed.

A case of a similar sort, in which the symptoms were of a more insidious character and in which the delusional ideas and impulsive actions were of a more serious nature, is as follows:

The patient is a young man of good parentage, who had always enjoyed excellent health. The first change was noted at twenty-eight. At this time he began to have trouble with patrons, lacked his usual civility in responding to minor complaints, and was surly. His duties at times were indifferently performed and some irregularities were noted. Old friends were dropped, and instead of going to the club evenings, he would walk through the main street alone and then return home to lie on the sofa or sit alone in his room. He ceased attending church and often argued against his religion. Unintentional annoyances by others while at work were taken as purposeful hindrances, and at times led to hot words. At home he could not tolerate jokes, but became angry and even profane with his sisters. He would not brook interference or tolerate any suggestions from his younger brother, by whom he thought he was being supplanted. The family, unaware of the pathological character of these manifestations, did taunt him rather more than usual, while the male members of the family coped with his surliness by administering one or more punishments. This behavior on their part gave rise to the idea that the family intended to force him to leave home. Following this he became still more sullen and resentful, and finally armed himself for an anticipated assault. Some months later, when reproved by his parents for the use of profanity in the presence of his sisters and ordered to leave the house, he shot and injured both his father and brother. Fortunately, this patient fell into the hands of two physicians who had had special training, and his disease was clearly recognized, so that he was sent to the hospital, where close examination corroborated their diagnosis of beginning dementia præcox.

It is not at all unusual that cases of dementia præcox, as the result of persecutory delusions, come in conflict with the law. Unrecognized by the medical and legal professions, most of these cases are subjected to the hardships of penal institutions instead of treatment in institutions provided for their care. During the past five years the majority of the youthful cases sent to our institution from the State's prison and jails, have been suffering from this form of disease, whose early symptoms must have been in evidence at the time of the commitment of their crime.

Neurasthenic Cases.—The third class of cases is represented by the following: The patient is a young man of good family without neurotic taint, except that his father had been intemperate and immoral, and there had been a history of tuberculosis on both sides of the family. He had passed through an uneventful boyhood, had been a good student, and after graduation had been successfully employed as a bookkeeper. From the ages of sixteen to eighteen he had been addicted to moderate masturbation, and also had been moderately intemperate. At nineteen, following an attack of gonorrhea, which had subsided into gleet, he presented a gradual change of character, first noted by his parents during his annual vacation at home. He displayed no interest in family affairs, but remained alone and seemed to be self-absorbed and suspicious. Unbeknown to his parents he was reading quack literature, and had consulted several physicians of the same order in reference to his trouble. He conceived the idea that the use of metallic sounds had forced the disease backward into the deeper parts, where it had communicated with the spinal column and was undermining his health by allowing the escape of the "vital fluid." This accounted for his various neurasthenic symptoms, such as pains in the head, dizziness, peculiar sensations in the limbs, as well as increased sense of fatigue. As objective symptoms he presented impaired nutrition, loss of weight, increased reflexes, and vasomotor disturbances. Self-absorption increased and his sole topic of conversation was in reference to his somatic disorders. He soon returned to his work, which he could follow with only indifferent success. He would frequently absent himself from his work, and would be found standing alone in the basement of the store, gazing vacantly before him. His incompetency increased and led to his discharge six months later. For the two succeeding years he remained about home, idling away his time. Meanwhile his hypochondriacal ideas of a sexual nature gradually faded and somatic delusions of a pronounced character took their place. He also expressed delusions of influence, and said that he was being hypnotized and that others could read his thoughts. Deterioration of memory and judgment advanced, and impulsive acts and silly laughter occasionally appeared. At the time of his commitment to the hospital at the end of this period the disease was already far advanced.

Such cases at the onset are naturally regarded by most practitioners as cases of neurasthenia. While it must be admitted that sometimes the distinction between neurasthenia and dementia præcox at the onset is not easy, yet most cases of the latter disease can be detected. In nuerasthenia there is always present an adequate cause for the asthenic state of the nervous system. This is rarely present in dementia præcox. The emotional attitude of the neurastheniac is very different from that of the dementia præcox patient. In neurasthenia there is usually some despondency, also apprehension for the outcome of the disease, but this emotional condition regularly varies, and the patients have their hopeful days, when they are cheerful and buoyant. Neurastheniacs regularly improve as the day wears on, and in the evening one usually finds them at their best, and capable of some mental application. In dementia præcox, on the other hand, when despondency is present, it is constant, and shows neither daily nor hourly variations. The usual emotional attitude is that of increasing indifference and apathy.

Again, hypochrondriacal ideas, while present in both neurasthenia and dementia præcox, are essentially different in each disease. In nuerasthenia the hypochondriacal ideas are extensive, usually involving several parts or organs of the body; there is the feeling of pressure in the head, roaring of the ears, palpitation of the heart, coldness and numbness of the extremities, etc. In dementia præcox hypochondriacal ideas are far less extensive, and usually center about one or two organs, and are quite apt to involve the sexual organs. Furthermore, in neurasthenia, hypochondriasis tends to increase except as the disease abates, while in dementia præcox it tends to diminish as the disease progresses. Neurastheniacs are apt to complain of failing mental power, and express the fear that they are losing their minds in the absence of such symptoms, but in dementia præcox, evidences of deterioration really exist, which are not recognized by the patient. Finally, in dementia præcox, impulsive acts are often present, but are rarely encountered in neurasthenia.

Hysteroid Cases.—The following record represents cases of dementia præcox in which hysterical symptoms are prominent: The patient, a young woman of good family history, was always considered eccentric, unusually bashful, and somewhat seclusive. At the age of eighteen, while in service as a maid, she began to show greater timidity, and became more seclusive and reticent. Two months later she left her place of employment and returned home unannounced. Here she immediately went to bed and remained there, saying that she did not feel well, though she presented no objective signs of illness. She complained of headache, indigestion, and palpitation of the heart, but refused medical attendance. Whenever her mother insisted upon her leaving the bed, she regularly developed hysterical attacks, with laughing, crying, screaming, and convulsive movements. In the course of four months she gradually improved, and upon the insistence of her mother, who found a place for her, re-entered service. She, however, worked indifferently and required constant prodding. Hysterical attacks were apt to recur at critical times when her assistance was most needed. Most of her time off duty was spent in her room, and she rarely went home to visit. Following this she frequently changed her places of employment, rarely staying longer than four weeks in any one place. These changes were usually made without warning, and always without excuse. On two occasions during the succeeding eight months she returned home for two weeks at a time, and suffered from what her physician called hysterical attacks. Finally she went home, saying that she had had a vision, probably an hallucination, in which she claimed to have seen a black woman enter her room and touch her while asleep. By this time it was noticeable that she had lost interest in her personal appearance, and was paying little attention to her religious duties. Sometimes her mother would find her sitting on the floor laughing over her baby books. The tendency to indulge in unrestrained and meaningless laughter became more marked, and she would laugh not only at table, but also on the street. Two months later, about one year after the onset of the disease, the patient was first seen by me, and from this time the disease has presented the characteristic picture.

The hysterical manifestations early in this case would naturally obscure the diagnosis. In differentiating dementia præcox from hysteria, the following distinctions should be borne in mind: In hysteria there is always present what is termed the hysterical basis. This condition usually makes its appearance during puberty, and is irregularly manifested by various hysterical symptoms. Such a condition occasionally antedates dementia præcox, but is by no means essential. The emotional attitude is quite different in the two diseases. In hysteria the patients are entirely under the control of their feelings, and we find them vacillating from one mood to another, impelled by the most thrilling incidents. At one time they are extremely despondent, at another very angry, and again they are happy and cheerful, or sullen, but always craving sympathy. In dementia præcox the characteristic emotional state is one of emotional indifference and apathy, with an absence of reaction to the environment. Transient despondency, or moderate exaltation, may be encountered, but those states do not vary from hour to hour or day to day. In hysteria hypochondriacal symptoms are extensive and involve more than one organ, while in a dementia præcox they are limited. Hysterical paroxyms are characterized by both sensory and motor nervous symptoms. In dementia præcox the only paroxyms that ever occur are motor and of an epileptoid nature. In hysteria the mental processes of perception and comprehension are unimpaired. The patients are even keen in the recognition of their environment, especially any defects in it. In dementia præcox occasional hallucinations, such as occurred in the last case, are encountered very early in the disease. In hysteria genuine hallucinations and delusions are never present. What may seem to be hallucinations and delusions are found, upon close inquiry, to result from fabrication and a lively imagination. The store of ideas in hysteria rarely suffers any impoverishment, though voluntary conversation usually centers about the patient's ills, but in dementia præcox desultoriness, or scattered thought, in which there is a lack of continuity, often occurs early, while progressive impoverishment of ideas regularly accompanies the course of the disease. Finally, hysterical patients are extremely egotistical.

The necessity of an early recognition of dementia præcox becomes all the more apparent when one learns that the disease in the vast majority of cases has been in existence one or more years before the patient comes to the hospital, in which interval some have wandered from home and become lost to the family, others have developed alcoholic habits, or have acquired sexual diseases, conceived and given birth to children, or have committed criminal assaults, all of which might possibly have been prevented. The honor of the family, the protection of society, and the welfare of the patient demand more careful attention from the practitioner to this common mental disease.

ON THE FREQUENCY OF ALIMENTARY GLYCOSURIA IN THE CHILDREN OF DIABETIC PERSONS.

By Arnold Lorand, M.D. (Vienna), Carlsbad.

Diabetes is, according to the notion of the day, a disease of which the principal symptoms consists in a diminished or absolutely abolished ability to assimilate carbohydrate food.

And normal individual can ingest an almost unlimited quantity of starchy food without passing a trace of sugar in his urine that could be found by the ordinary tests of Trommer, Nylander, etc. It is otherwise with the diabetic. He will eliminate a smaller or larger quantity of sugar according to the quantity of amylaceous food which he has introduced into his system.

We must not think, that it would be also contrary to the elements of pathology to presume, that such a dystrophy could be the result of a sudden change in the ordinary metabolism of the sugar. It has certainly been prepared insidiously by a long course of events. It has been slumbering in the diabetic when he was still a child; then owing to an irrational nourishment, probably aided by nervous influences, psychical emotions, grief, sorrow, etc., it breaks out sooner or later into open diabetes. Its first manifestation may be the presence of traces of sugar (alimentary glycosuria *e saccharo*) after the ingestion of a quantity of grape-sugar (exceeding 50 grammes); the next degree would be the elimination of traces of sugar after starchy food (alimentary glycosuria *x amylo*); the higher degree of this pathological state is the "light" diabetes, which, owing to indiscretion in diet, or, what is still worse, to a long-continued irrational (" too severe" *à la Cantam*) dieting, can pass into the "severe" diabetes with its following acid intoxication (Stadelmann) and final coma. This is the general course of the disease, and exceptions, for the better or for the worse, are frequent.

As a result of such considerations, and given the fact that diabetes very often developes itself on a hereditary base, it is very easy to suppose that what is present in the diabetic parent to a larger extent will also show itself to a greater or smaller extent in his child. To ascertain this I have given to several children of diabetic parents amylaceous test-dinners with a view to produce alimentary glycosuria *ex amylo*. I have attributed to this pathological state a greater importance for the purpose of my deductions, as it is in closer relations with the real diabetes, and is not so dependent upon individual influences as the alimentary glycosuria *e saccharo*. According to v. Noorden[1] all persons who eliminate sugar after starchy food must be suspected of real diabetes, and need careful watching. I have given the following test-dinner:—Barley-soup, beef or a thin cutlet, a plate of potatoes and one of rice, a piece of cake, a few figs; half a litre of Bavarian beer, two rolls of white bread, equivalent to a total amount of about 250 to 300 grammes of carbo-hydrates. I have preferred to give such mixed test-meals, as they are more apt to cause glycosuria, as was shown by Kleen[2] in his interesting work on diabetes. The urine that has been eliminated between two and four hours after these test-dinners has been examined by the tests of Trommer and Nylander, and in doubtful cases by the phenylhydrazin test of Fisher with the modification of v. Jaksch, and by the fermentation test. These investigations have been performed on ten persons who were in a healthy condition; two of them, however, presented symptoms of neurasthenia, a state in which alimentary glycosuria is not frequently found. I may point out, however, that nervous diseases and diabetes often occur in the same family. I have taken pains to secure that no drugs were administered at the same time, such as morphia, salicylate of sodium, etc., which could have accounted for a possible glycosuria. In the following lines I will give a short history of the cases with the result of the examination by test-meals:—

Case 1.—A. N., a boy of 11 years. His mother, 48 years of age, suffering of severe diabetes, mentioned that her mother, too, used to be very thirsty in the latter years of her life (she died at the age 68). The urine after an ordinary meal strongly reduced Trommer's test, and the reduction substance was ascertained by the plenylhydrazin test to be grape-sugar. After the test-dinner there has been found 0.1 per cent. of sugar. The patient suffered from acne of the face and small furuncles in the neck. He used to get up in the night to urinate. He has a sister 14 who is getting unduly fat. He appears to be a nervous boy.

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[1] V. Noorden: Die Zuckerkrankheit, 3d Edit. Berlin, 1901, p. 15.

[2] Kleen: Diabetes mellitus and Glycosuria, 1901, p. 18.

Case 2.—Miss H., 18 years old, was in vigorous health, but she had a tendency to obesity. Her father had light diabetes at 60 years of age. Her urine from the night till morning, examined on two occasions, showed at the first examination small traces of sugar, but none at the second. A test-dinner, twice given, was each time followed by the appearance of distinct traces of sugar in the urine. She used to have frequent outbreaks of acne and sometimes furuncles.

Case 3.——J. H., brother of the last case, is 16 years old. His morning water contained no sugar, but after a test-dinner there were found small traces of sugar.

Case 4.—E. D., a girl of 12 years, was in robust health, but with adenoid vegetations. She exhibited many comedones in face. Her mother died of severe diabetes. Her urine showed no trace of sugar after a test-dinner. My colleague, Dr. Müller, of Carlsbad, having removed the adenoid growths, the urine has again been examined on the day following the operation after administration of a test-dinner, but no sugar was found. A sister of her mother was following the Carlsbad cure for obesity (weight 125 kilos.). At the beginning of her case I have found small traces of sugar in the morning urine, somewhat more after an ordinary meal, and very distinct traces after a test-dinner.

Case 5.—A brother of the last case, 13 years old, used often to have acne of the face and little furuncles on the neck. After a test-dinner distinct traces of sugar were found in the urine at two examinations. He exhibited also a few spots of grey hair.

Case 6.—Mrs. L., 24. Her mother, aged 52 years, is under my treatment for light diabetes. The water examined after a test-dinner showed in the case of Mrs. L. no trace of sugar. She has a tendency to obesity.

Case 7.—Mr. S., brother of the last, aged 22 years. His water after a test-dinner contains distinct traces of sugar.

Case 8.—Dr. H., aged 35 years, suffers from neurasthenia. His mother had light diabetes, suffered for a long time from Pruritus vulvæ, and died in consequence of gangrene. As a medical student he discovered by Trommer's test the presence of some strongly-reducing substance in his urine, which he thought was sugar. Since then he ascertained that each time he has eaten rice or sweet food he eliminates traces of sugar in his water. On taking 100 gr. grape-sugar two hours after a light breakfast he passed 0.1 per cent. of sugar. When a boy his face was covered with acne-spots, and even now a few such lesions often appear on his face and neck. Impotency would show itself temporarily. He exhibits a tendency to fatness, and has many spots of grey hair.

Case 9.—Mrs. T. M. is 40 years old. Her father had diabetes. Her urine contains distinct traces of sugar after a test-dinner. She suffers from neurasthenia. Her hair is almost entirely grey.

Case 10.—Mrs. F., 26 years old, mother of three children, was following the Carlsbad cure three years ago, having passed gall-stones several months before. All that time I found traces of sugar in the afternoon urine, which I attributed to accidental transitory glycosuria. I was, however, more sure of the nature of her glycosuria when her mother (65 years old) came to Carlsbad this summer to follow a "cure" for obesity and light diabetes, which, as seems to be usually the case, was found accidentally last winter by the local practitioner.

As we have seen in the history of these cases, in 8 cases out of 10 elimentary glycosuria *ex amylo* was found. I may mention here that according to the lately-published work of Hirschfeld,[1] normal urine should not contain more than 0.05 per cent. of sugar, which cannot be found by the ordinary tests (Trommer, Nylander).

It seems accordingly that in the majority of the cases the children of diabetic persons have inherited a certain defective power of dealing with sugar in their economy. Apparently in such persons the power to assimulate carbo-hydrates is diminished. This is the principal symptom of an inherited diabetic predisposition. I may mention here shortly that there are other important symptoms too. Thus I have very frequently found in such persons the presence of acne vulgaris not only in the years of puberty, but also in fully grown-up persons. Several of the patients whom I mentioned above had acne. Obesity was also frequent amongst them, and according to v. Noorden[1] this is a symptom of diabetic predisposition. Such persons have lost the ability to burn thoroughly the sugar in their organisms, but they can still deposit it in the form of fat in the tissues. v. Noorden calls it "diabetogenic" fat.

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[1] Hirschfeld: Die Zuckerkrankheit, Leipzig, 1902, p. 12.

It is also noteworthy that precocious puberty can often be observed in such children. They very often present a healthy red colour, and are frequently of a bright and active disposition. They not seldom get short-sighted after the years of puberty, and they also often get grey before the usual time. Gingivitis, alvoelar pyorrhœa, atrophy of the gum, and retraction of the dental pulp also constitute symptoms of a diabetic predisposition that can frequently be found in descendants of diabetic parents. Senile changes, as atrophy of the gum and retraction of the pulp, can be found in such individuals even when they are at a comparatively young age.

All these persons are candidates for diabetes, but it does not necessarily follow that the disease will develop in each case. It can develop itself in persons who are addicted for a long time to an irrational nourishment (containing abundance of meat and also of sweet and amylaceous food). Its appearance in the majority of cases is about the 35th to 40 years. Owing to great psychical emotions, however (grief, sorrow, and especially psychical shock), it may appear much sooner. Of course, the prognosis will be better the later, and worse the sooner, diabetes actually makes its appearance. And this will show us the line of conduct to adopt. We must do our best to defer its advent to a late period, or, if it is possible, to prevent its onset altogether. For this purpose we should recommend such persons not to take any great quantity of sweet or amylaceous food. We should also advise them to lead rather a frugal than a luxurious life, avoiding rich food, as this would increase the morbid tendency, especially if for a long time much meat is taken simultaneously with large quantities of sweet and amylaceous food. I refer here to the well-known fact that in India diabetes is exceedingly rare among the poor Hindus, who live only on rice, and most frequent among the rich Hindus, who eat much meat as well as rice. But in Europe also we may observe the fact that diabetes is most frequent amongst classes who eat much meat and amylaceous food simultaneously. Thus it is more frequent amongst the rich than the poor.

It is an interesting fact that the extirpation of the pancreas produces diabetes only in those birds which eat meat (birds of prey), whereas geese, ducks, pigeons, etc., as a rule do not show

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[1] V. Noorden: Die Zuckerkrankheit, 3d Edit., 1902, p. 55.

diabetes after the extirpation of the pancreas. (Minkowski, Weintraud, Kausche.).

As it is known, the products of decomposition of the meat produce a hyperactivity of the thyroid gland, and, as I have established in a communication[1] to the Congress of Madrid, the hyperactivity of the thyroid gland can produce diabetes, especially when there are simultaneously degenerative changes in the pancreas (island of Langerhans).

We must equally supervise the psychical education of these children. We should recommend them not to embrace callings in which they might be exposed to great intellectual strains or psychical emotions (physicians, lawyers, stockbrokers). On the other hand I consider sport of all kind very valuable for such children. But, much as I should recommend it to robust children with a solid nervous system, just as emphatically would I forbid it to nervous persons with inherited diabetic tendency for the fear of a possible accident. As I have pointed out previously,[2] the slightest accident that occurs to such persons may cause a traumatic diabetes.

As I have found[3] that alkaline mineral waters are able to improve the assimilative power for carbo-hydrates in cases of alimentary glycosuria, I should consider them as a useful preventive, or at least dilatory agent, against diabetes. They will certainly be more efficacious in such cases than in those in which diabetes has established itself long since in all its vehemence.

If diabetes is still at present an incurable disease—for although the sugar may disappear it nearly always comes back—on the other hand it is by no means impossible to prevent it. It ought to be brought home to the profession that there exists a means of prophylaxis not only against tuberculosis, which at present absorbs all its attention, but also against diabetes. The prophylactic measures against diabetes have also the advantage that they are more easily carried out, and also more efficacious than those against tuberculosis. It is sad to think how many precious lives could have been saved from early death if many of us could have been sooner aware of this fact.

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[1] "Sur les rapports du diabète avec l'acromégalie et la maladie de Basedow." Communication au Congrés International de Madrid, 25 Avril, 1903.

[2] Lorand: *Die rationelle Behandlung der Zuckerkrankheit, Berlin,* 1903.

[3] *Verhandlungen des VII Congresses Deutscher Aerzte.*

THE RELATION OF THE STATUS LYMPHATICUS TO SUDDEN DEATH, DEATH UNDER ANESTHESIA AND INFECTION.

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Introduction.

There is probably no form of sudden death which has received so much attention from the medical profession in recent years as that form associated with the hyperplasia of the thymus gland and the lymphatic apparatus in general, known as the "status lymphaticus." At the same time that discussion regarding *spontaneous* sudden death in this condition has been going on, a few articles have called attention to the similarity which exists between the lesions of this form of spontaneous sudden death, and many cases of death under anæsthesia, and an occasional article also has suggested a relationship between sudden death during infectious diseases and the status lymphaticus.

All three classes of cases are of interest to the physician both from a purely professional and from a medico-legal point of view. From a purely professional standpoint it is of the greatest importance that we should recognize the existence of a class of individuals, the subjects of a peculiar constitution which renders them extremely susceptible to shocks of various kinds, physical, and toxic, and which may lead to their sudden death from accidents which to the ordinary individual would be trivial. In considering this aspect of these cases we need only recall the instances where death has followed some trivial shock, or as trifling an operation as the hypodermic administration of a standard remedial agent. Instances are on record where individuals who were subjects of this constitution have died from the shock of a plunge into cold water, and the case of Prof. Langerhans' child, who died a few minutes after the administration of antitoxine, is familiar to many medical men. The medico-legal aspect of these cases bears mainly upon sudden death in apparently healthy infants where a suspicion of foul play is entertained. A number of cases are on record where nursemaids, or relatives, have been accused of suffocating or fatally maltreating infants, the true cause being shown by the autopsy to be the status lymphaticus.

Aside from the relation of the status lymphaticus to the class of cases above enumerated, certain authors have called attention to its rather frequent coexistence with other diseases, notably with rachitis, epilepsy, and exophthalmic goitre. It is not the purpose of this paper to discuss the relationship between these conditions and the status lymphaticus further than to state that *such a relationship is by no means constant.*. While we admit the relatively frequent association, and even believe that the status lymphaticus may modify the course of these diseases when associated with them, we can see no evidence which proves that these diseases are dependent on change in the thymus or lymphatic apparatus, and we regard the coexistence as merely a coincidence.

The object of this paper, as expressed by its title, is to endeavor to show the common factor which underlies cases of sudden death associated with the "status lymphaticus" whether these occur spontaneously, or under the influence of a chemical (anæsthesia) or bacterial (infection) poison. We might add that we deem it probable that the same common factor underlies cases of epilepsy or exophthalmic goitre associated with the status lymphaticus, but this is merely an assumption on our part, as we have had no personal experience with such cases.

The views which are here set forth are based upon the study of nine cases of sudden death occurring in infancy and childhood, and upon the study of the available literature. We would point out in passing that, in our opinion, the great weakness of most of the articles on the subject lies in the almost total failure to consider the histology and bacteriology of the condition, subjects which are briefly touched on in some reports and which we aim to treat more fully. Inasmuch as the pathological anatomy and histology are essentially the same in all classes of cases we shall consider the clinical features first, next discuss the pathology, and finally consider the theories regarding the import and significance of the status lymphaticus.

Clinical Considerations.

SPONTANEOUS SUDDEN DEATH ASSOCIATED WITH THE STATUS LYMPHATICUS.

General Considerations.—The association of sudden death with enlargement of the thymus was noted as long ago as 1723 by Bichat, but the subject was not brought into prominence until 1829, when Kopp emphasized it, and also drew attention to the so-called thymic asthma. Friedleben's monograph in 1858 threw doubt upon the relation of enlarged thymus to sudden death, and the subject remained quiescent until 1888, when the work of Grawitz in Germany and Jacobi in this country revived it. The recognition of the fact that the enlarged thymus is merely part of a general hyperplasia of the lymphatic apparatus we owe to the Vienna school, and particularly to Paltauf. In some cases, and particularly in adults, the lymphatic hyperplasia is associated with a hypoplasia of the heart and aorta, similar to that described by Virchow in chlorotic subjects, so that in connection with these cases Paltauf speaks of the chlorolymphatic constitution.

Before describing the various clinical pictures which immediately precede the death of these patients, it may be well to consider whether it is possible to make a diagnosis of the status lymphaticus before the onset of the attack which is the immediate cause of death. Certain clinicians, and particularly those of the Vienna school, believe that individuals who are the subjects of the lymphatic constitution can in many cases be recognized. Escherich, who has studied these cases carefully, states that they usually have a pale, thin skin, a pasty complexion, and a good pad of subcutaneous fat. Frequently signs of rachitis or scrofula are present. The superficial lymph glands, especially those of the neck and axilla, are enlarged. There is hypertrophy of the tonsils, the circumvallate papillæ of the tongue, and the pharyngeal lymphatic apparatus (adenoids). The spleen is often palpable. Daut adds that a percussable thymus may develop later, and Ewing's work strongly suggests that an increase in the lymphocytes of the blood is in all likelihood present.

Unfortunately up to the present time our knowledge of the clinical symptoms of these cases relates mainly to the appearances observed immediately or shortly before the death of the patient, and this is almost of necessity the case, inasmuch as the majority of these patients are apparently in perfect health up to within a short time of the fatal issue. The clinical picture varies in different cases, and we shall attempt to classify the cases according to the clinical features, though the immediate causes of death are probably only two, cardiac paralysis and asphyxia.

Cases found dead in bed.—A number of our cases, and of the cases in the literature, come under this heading. This type of death usually occurs in young infants, and most of the cases in which foul play has been suspected are of this nature. It is a question whether many of the cases of "overlying" of infants would not be found to be instances of death from status lypmhaticus if investigated. The manner of death in these cases is of necessity uncertain; at the same time there are grounds for believing that the infants are not perfectly well for a short time, perhaps some hours, before death, and probably death takes place in convulsive seizure. In some of our cases of this character, which occurred in St. Margaret's House, under Dr. H. L. K. Shaw, the records show that the children refused food sometimes as long as an hour before they were found dead, which is presumable evidence that they did not feel well. A death in convulsions is also suggested by the history of some of these cases, of which the following case, which occurred in the practice of Dr. G. Emory Lochner, is an example:

The mother of an apparently healthy female child, ten months of age, was in the habit of putting her to sleep in a baby carriage on the veranda while she attended to her household duties. On March 16, 1903, she followed her usual custom. Whilst working near an open window in the neighborhood of the baby carriage she heard the child move, and looking out at her saw her struggling. Thinking that she was merely struggling in her sleep she avoided going very close to her, but on returning and looking at the child a few minutes later she found her dead.

Cases of sudden death presumably of cardiac origin.—Under this head we may reasonably place cases where the death was very sudden and not preceded by respiratory disturbances. In all probability cases reported by Nordmann and others, where sudden immersion in cold water was followed by instant death, belong to this class. It is questionable whether some of the cases found dead in bed should not also come under this heading.

Cases of sudden death, presumably of respiratory origin.—Most of the cases of sudden death in status lymphaticus with symptoms of respiratory difficulty may be classed under the general heading of thymic asthma. There is no doubt that this condition has been confounded by some observers with ordinary laryngismus stridulus, but the majority of clinicians who have studied the two conditions in recent years agree that there is no relation between the two diseases. Lange states that the paroxysm in thymic asthma differs from that in laryngismus stridulus in that regular sighing respiration is present throughout the attack in the former condition. The history of one of our cases tends to show that this is not necessarily so. The cases of thymic asthma do not all present the same clinical picture; in some instances the child dies in the first attack or series of attacks, whilst in other cases the condition may last for a week or even years, and finally terminate in a fatal attack or relief by operation. The operative procedures thus far resorted to in these cases have been total extirpation of the gland or partial extirpation and pulling upward of the gland, the portion left being anchored to the sternum high up. The following case, which occurred in the service of Dr. W. H. Happel, in the Albany Hospital, well illustrates the form of thymic asthma which is rapidly fatal. I quote from Dr. Happel's history:

> A male child, apparently healthy and weighing 6½ pounds at birth, continued to gain weight up to the 14th day of his life. On the morning of the 14th day it was noted that he had made no gain in weight but seemed otherwise well. At 4 p. m. he was found cyanosed at his mother's breast. He was unconscious, with crowing inspiration. The reflexes were abolished. The pulse was slow and gradually became slower. The inspiration became quicker and shorter, and then both pulse and respiration ceased. The child became rigid, cyanotic, and pale. The thorax was arrested during inspiration. The child became limp. After about thirty seconds a loud inspiratory shriek ushered in the respiration and the heart beats completing a marked attack of laryngismus stridulus. The attacks were repeated several times, the child never becoming conscious in the intervals. Death occurred seven hours after the onset of the first attack. From the presence of a percussable dullness over the manubrium Dr. Happel made a diagnosis of thymic hyperplasia with status lymphaticus, which was confirmed at autopsy.

These cases in which the child dies during an acute attack after a few hours, or even in the first attack, are much more common than the cases running a more protracted course. We cite the clinical history of a chronic case from Purrucker:

> An otherwise healthy child, 2½ years of age, with no signs of rickets, and no palpable glandular enlargements, had suffered from difficulty in breathing since the age of two weeks. There was a gradually increasing inspiratory dyspnea with sudden attacks of greater severity, and the parents feared sudden death from asphyxia. When the child was quiet it breathed slowly and noisily. The noise was louder on lying down than when the child was sitting up. There was no cyanosis. Pyschic disturbances increased the dypsnea. Purrucker describes the clinical picture as being typical of the stridor of infants. Operation was finally decided on and an enlarged thymus was removed without difficulty, the child making a prompt and satisfactory recovery and the symptoms disappearing.

Some cases of death in status lymphaticus die with signs of suffocation and without definite asthmatic seizures. Such cases are described by Gerhardt and also by Somma. The child presents accelerated respiration, an access of suffocation, cyanosis, dilatation of the pupils, swelling of the veins in the neck, and death occurs in a few minutes.

Cases of sudden death, presumably of nervous origin.—The occasional association of the status lymphaticus with epilepsy has already been briefly referred to. Ohlmacher has called attention to the resemblance between the attacks in the two conditions. While we have no cases to report of this association of conditions, we would point out that the manner of death in some of the reported cases of status lymphaticus resembles the type of death associated with lesions of the central nervous system rather than that due primarily to cardiac or respiratory failure. Some of the cases reported have died very suddenly during a spasm which by some writers has been described as epileptiform.

Laub has described cases of what he calls the cerebral form of death from status lymphaticus. This form differs from the ordinary form in several particulars. It usually occurs in young adults and causes death in a few hours, eighteen at the outside. The individual is attacked suddenly with coma or perhaps epileptiform convulsions. Sometimes cramp of the glottis occurs, or vomiting of a cerebral type. The urine usually contains albumen but no casts. The post-mortem picture is the ordinary one of the status lymphaticus plus cerebral edema. Laub considers that these cases differ from the ordinary ones in their slower development, this allowing time enough for the occurrence of cerebral edema and the resulting nervous phenomena.

THE RELATION OF THE STATUS LYMPHATICUS TO DEATH DURING ANESTHESIA.

Within the last few years attention has been called to the relation of the status lymphaticus to deaths during or soon after the administration of an anæsthetic. In Europe, Bayer, v. Kundrat and Ploc have especially noted this phase of the subject, and in this country Hinkel, and more recently Blake, have emphasized it. Almost all observers agree that in these cases death is due to *cardiac* failure, and most of the case histories show plainly that respiration persists after the heart has stopped beating. In some cases premonitory symptoms in the form of pallor, dilation of the pupils, weakening of the pulse and shallow respiration are observed, but in many instances death is instantaneous. It was thought by the earlier writers that chloroform was especially dangerous as an anæsthetic in these cases, but in recent years it has been shown that deaths have also occurred under ether, and the A. C. E. mixture of Billroth. The fact that chloroform was at first regarded as unusually dangerous was no doubt due to the fact that the earlier cases were reported from Europe, where this anæsthetic body is largely used. Blake's cases show plainly that ether is also dangerous. The reported deaths under anæsthesia have occurred at all ages, and bear no particular relation to sex as far as can be judged. When we come to consider whether deaths from anæsthesia associated with the status lymphaticus bear a relation to any particular disease or diseases, it would seem as though two classes of patients are especially liable to this accident, patients with goitre, either simple or exophthalmic, and patients with adenoid vegetations.

THE RELATION OF THE STATUS LYMPHATICUS TO INFECTION.

There is very little in the literature bearing directly on this phase of the subject. Paltauf suggests that the real cause of death in some of the cases supposed to have died in status lymphaticus was capillary bronchitis, but our cases, which were controlled by histological and bacteriological examinations, do not support this view. Daut has published an interesting series of cases from Escherich's clinic, in which he discusses the effect of the status lymphaticus on diphtheria. He found that over a quarter of the patients dying from diphtheria presented the picture of the status lymphaticus. Distinct modifications of the clinical picture of the disease were present in these cases. In some instances the patients had a hoarse barking cough and a hoarse voice, associated with attacks of spasmodic suffocation, weakness of the heart, and rapidity of the pulse. These attacks were altogether out of proportion to the severity of the membrane formation as shown post mortem. In other cases the patient died suddenly, having shown no unusual symptoms during life referable to the status lymphaticus. In this connection we give the clinical histories of two of our cases which show that the status lymphaticus may mask or modify other infections.

(1) *Tetanus modified by the status lymphaticus.*—The patient was a case of Dr. W. O. Stillman.

The patient, a boy of twelve years, accidentally wounded himself on the inside of one of the fingers of the right hand while discharging a toy pistol July 3, 1900. The wound was a very slight one and attracted but little attention. It was treated with ordinary home remedies and appeared to be doing fairly well, although there was a very slight discharge from it. The patient remained in good health until Friday, July 6, when he complained of headache, chilliness, general malaise and sore throat. He was seen on Friday evening by a physician, who administered some palliative remedies. The patient had a very restless night Friday night, complained of most intense headache, pain in the back of his neck, as well as general aching through the muscles of the back, arms and legs. The temperature on Friday was somewhat elevated, between F. 100° and 101°. On Saturday morning the patient appeared to be somewhat worse, the temperature was in the vicinity of F. 101°, the throat was quite sore and the tonsils decidedly swollen. The headache and other pains were about the same. The case was regarded as one of tonsilitis and treated as such. The patient's symptoms became somewhat worse during the day on Saturday and he passed an extremely restless and uncomfortable night Saturday night. Saturday afternoon he complained of some difficulty in opening the mouth, which at the time was attributed to the swollen tonsils. This difficulty became worse during the night, and Sunday forenoon, about 10 o'clock, all of the patient's symptoms having become decidedly worse, he was suddenly seized with opisthotonos, and died in a few minutes.

The autopsy was done on the morning of the following day, Monday, by Dr. Elting, and showed the usual lesions of the status lymphaticus, and cover-slips from the wound of the finger showed large numbers of typical drum-stick tetanus bacilli.

(2) *Streptococcus infection modified by the status lymphaticus.*

The patient was a boy of thirteen years of age, with a history of never having been strong, and of showing dyspnea on exertion since childhood. There was no history of epilepsy. He was an inmate of an orphan asylum, and apparently in his usual health until within a short time of his death. On the day of his death he suddenly became cyanotic a short time after his evening meal, had one or two convulsions and died in fifteen minutes.

The autopsy showed the usual picture of the status lymphaticus, with acute bronchitis and congestion of the lung. Cultures showed a general streptococcus infection.

It would seem from Daut's experience and the cases just reported that the status lymphaticus may have been a distinct influence on infections, sometimes modifying their course, and sometimes masking them. Daut's experience with diphtheria shows a distinct modification of the ordinary clinical pitcure in some cases, and in the two cases reported by us the tetanus case showed an unusually acute course, and the case of streptococcus infection was completely masked up to the time of the patient's death.

THE PATHOLOGICAL ANATOMY OF THE STATUS LYMPHATICUS.

There is a general agreement among pathologists as to the gross lesions associated with the status lymphaticus. These consist, broadly speaking, of a hyperplasia of the thymus gland, and of the lymphatic tissue of the body in general. It is necessary to state, however, that the degree of hyperplasia, and also the extent of it, varies in different cases. In practically all cases the thymus is hyperplastic, but in some cases only one or two groups of glands may be affected, in others the intestinal or the splenic lymphatic apparatus may be especially involved, and in still others there may be a widespread hyperplasia of all of the lymphatic tissues of the body.

Aside from these lesions of the lymphatic apparatus, which are constant, we find other lesions present with a fair degree of constancy. Hypoplasia of the vascular system, first pointed out by Paltauf, has been described more frequently in adults and children nearing puberty than in infants. In some cases compression of the trachea by the enlarged thymus has been noted, and in instances of this kind the accompaniments of asphyxia may be present in the form of subpleural and other subserous hemorrhages, and atelectatic patches in the lungs. Edema and congestion of the lungs have also been noted in some cases. Edema of the brain has been described by Laub. Some observers have described a lymphoid condition of the bone-marrow, and occasionally an enlarged thyroid gland has been noted.

THE HISTOLOGY OF THE LYMPHATIC APPARATUS AND THYMUS IN STATUS LYMPHATICUS.

The close histological study of these cases has been strangely neglected. Paltauf, and later Ewing, speak of the lesions as a simple hyperplasia. Lartigau in Blake's paper describes lesions in the spleen which he compares to the lesions found in diphtheria and other infections. The lesions which we found were constant and identical in all of the nine cases examined, though differing in degree. Briefly stated they were as follows: In the thymus gland there was a general hyperplasia of the lymphoid elements, associated at times with proliferation of the endothelial cells lying along the trabeculæ of the organ. In the lymph nodes, Malpighian corpuscles of the spleen, the tonsils, and the lymphatic apparatus of the intestine there was a general hyperplasia associated with focal changes. These focal changes occurred in the lymphatic apparatus in connection with the germinal centers, and in the spleen in the Malpighian corpuscles. The lesion in the lymph nodes, tonsils, and intestinal apparatus consisted of a proliferation of the cells composing the germinal centers, associated with slight degenerative changes in the proliferated cells. In the spleen a similar proliferative process was to be noted in the Malpighian corpuscles associated in places with a decided proliferation of the endothelial cells of the vessels of these bodies. The lesions very closely resemble those seen in various infections, and differ we believe only in degree, degenerative changes being much more marked in case of bacterial infection.

THE BACTERIOLOGY OF THE STATUS LYMPHATICUS.

Very few statements are found in the literature regarding this point, which in view of the histological findings is a very important one. Lartigau's report in Blake's article indicates that cultures were negative in this series of cases. In our cases cultures, and in some cases cover-slips, were made, and it was found that outside of the cases definitely stated to be infected, the cultures were sterile. It is true that pus cocci were ocasionally found in the lungs, and that the ubiquitous colon bacillus was also present in some cases, but we do not consides either of these findings evidence of infection; they are rather instances of agonic or post-mortem invasion. Some other factor than bacterial infection therefore must be held responsible for the lesions in most cases of the status lymphaticus.

THE CAUSE OF DEATH IN THE STATUS LYMPHATICUS.

A variety of explanations have been advanced from time to time to account for sudden death in the status lymphaticus. These explanations naturally fall under one of two heads: theories assuming that death is due to mechanical pressure of the enlarged thymus upon structures of vital importance, and theories assuming that death is due directly to cardiac paralysis, and indirectly to some form of toxæmia. We shall consider both groups of theories and their various subdivisions more or less in extenso.

The most important of the mechanical theories assumes that death is due to asphyxia from compression of the trachea by the enlarged thymus gland. This theory has developed a great deal of opposition, doubtless because many observers have never seen cases in which there was evidence of compression of the trachea. This, in fact, has been our experience, for in only one of our nine cases was there any evidence of tracheal compression, and in this case the compression was only partial and not sufficient to interfere with respiration. The supporters of the tracheal compression theory point out the very narrow space in children between the manubrium and the spinal column (2 cm.), and the fact that throwing back the head greatly increases the pressure on the trachea. The opponents of this theory emphasize the great difference between the weight of the enlarged thymus and the compressibility of the trachea. The thymus in very few of these cases exceeds fifty grammes in weight, and, according to Tamassia, it takes a pressure of 180 grammes to compress the trachea; according to Scheele 750 to 1,000 grammes weight is needed. It seems reasonable to believe that these opposing views are largely due to diverse individual experiences, for although many of the cases show no evidence of tracheal compression, in others the evidence is very convincing. Such writers as Grawitz, Clessin and Lange have published cases in which the evidence of compression seems incontrovertible.

Other writers suggest the possibility of death being due to compression of structure other than the trachea, as the heart itself, the large vessels, or the large nerves or nerve plexuses. It is supposed that pressure on the heart might interfere with its action, and in one or two reported cases the auricles are stated to have been atrophic. The advocates of the theory that pressure on the large vessels may cause death assume that such pressure may cause a fatal anæmia of the brain. Pressure on the nerves (pneumogastric, phrenic) or nerve plexuses (cardiac, respiratory), might cause death either reflexly or by direct paralysis of the heart or lungs. With regard to all these theories we may simply state that there is practically no anatomical support for any of them, and they therefore belong in the domain of pure hypothesis.

The theory that the cause of death in the status lymphaticus may be a toxæmia was voiced by Escherich, when he compared this condition with myxœdema and exophthalmic goitre. This view would assume that the process was due to an over-production of the internal secretion of the thymus. Inasmuch as the evidence in favor of the possession of an internal secretion by the thymus is contradictory in the extreme, and taking into account the histological structure of the organ, we feel somewhat skeptical as to the existence of a true internal secretion from this gland, and would suggest that it is in all probability merely a lymphatic organ. It is true that it possesses epithelial elements in the form of Hassal's corpuscles, but hardly anybody, as far as we know, has ever claimed that they are anything more than rests explicable by the mode of origin of the gland. In Blake's article Lartigau suggests a toxic origin for these cases from a study of the histological lesions, but does not state definitely what he considers the nature of the toxine to be. In connection with the toxic theory we wish to call attention to the great similarity which exists between the lesions of the status lymphaticus and the lesions described by Flexner in his paper on lymphotoxæmia. We quote from Flexner his description of the lesions produced in the guinea-pig by lymphotoxins:

"The changes in the lymph glands are diffuse, affecting the cortical nodes and the medullary strands of lymphatic tissue. The most striking alteration is found in the germinal centers and consists of increased swelling, and, to a small extent degeneration of the large cells composing these areas. The enlargement of the centers is accompanied by a general lymphoid cell hyperplasia. Mitoses in the clear cells occur but some of the figures undergo subsequent degeneration. The chief form of cellular degeneration is that attended by vacuolization and fragmentation of the nuclei; pyknosis is also encountered.

Spleen.—The changes in the spleen appear to be limited to the Malpighian bodies, in which the germinal areas are increased in size; mitosis is actively progressing, and nuclear degenerations, while met with, occur less frequently than in the lymph glands."

We would therefore advance the hypothesis that the condition which is present in the status lymphaticus is one of lymphotoxæmia. It is not necessary to assume, we think, that the toxæmia is constantly present; in fact the clinical pictures are more readily explained by the assumption that it is intermittent. In order to accept such an explanation it is of course necessary to assume that at times the so-called "horror autotoxicus" is in abeyance, and we can see no theoretical reason why this should not be the case. In this connection we quote from Dr. Welch's Huxley lecture. In speaking of cytotoxins he says:

"But the really great practical questions in this domain relate to the production of autocytotoxins in the human and animal body. What is the nature of that very efficient regulatory mechanism underlying the horror autotoxicus which prevents either the action or the formation of autocytotoxins in consequence of absorption of our own degenerated and dead cells? Can this protective mechanism be overthrown by pathological states and self-generated cellular poisons become operative in the causation of anæmias, hæmoglobinurias, chronic interstitial inflammations, uræmia, eclampsia, epilepsy, and other diseases?"

We would suggest that individuals who are subjects of the status lymphaticus are born with an instability of the mechanism regulating the "horror autotoxicus," at any rate so far as the lymphatic apparatus is concerned, so that they are subject to intermittent attacks of lymphotoxæmia, which may lead to reflex nervous phenomena of various kinds, or may cause death from cardiac paralysis. During the attacks of lymphotoxæmia such individuals are especially susceptible to the action of bacterial or chemical poisons, and also to physical and psychical shocks, which at these times may cause their death under circumstances which would be trivial to a normal individual. Assuming the possibility of this hypothesis it would seem from experimental evidence that a so-called vicious circle might be established. Flexner's experiments show that the lymphocytotoxins cause a hyperplasia of the lymphatic apparatus, and succeeding mild attacks might therefore cause a progressive hyperplasia of the lymphatic apparatus, increasing the amount of lymphoid tissue which might take part in subsequent attacks of lymphotoxæmia.

CONCLUSIONS.

1. The condition known as the status lymphaticus is a definite pathological entity.

2. It is probably associated with, if not due to, a condition of intermittent lymphotoxæmia.

3. It may be associated with sudden death, probably as a result of lymphotoxæmia alone in some cases, or as a result of the action of toxic, physical, or psychic injuries, which are rendered much more powerful than usual by the predisposing action of the lymphotoxæmia.

4. In some cases the sudden death is undoubtedly mechanical and due to asphyxia from pressure of the enlarged thymus on the trachea.

5. The subjects of the status lymphaticus can be recognized clinically in some instances.

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APPENDIX.

Abstracts of the histories of the nine cases on which this study is founded, together with the abstracts of the autopsy protocols and histological examinations are here appended. We desire here to express our thanks to the following gentlemen who have kindly furnished us with the clinical histories of the cases: Drs. W. H. Happel, G. E. Lochner, W. G. MacDonald, H. L. K. Shaw, W. O. Stillman, T. M. Trego and Howard Van Rensselaer.

Group I.—Cases dying suddenly or found dead in bed—

CASE I.—Female child, five months of age, St. Margaret's House; service of Dr. Van Rensselaer. The child was apparently perfectly healthy until a few minutes before its death (February 10, 1899), when it suddenly became cyanosed and collapsed.

The *anatomical diagnosis was:* Enlargement of the thymus gland and the mesenteric lymph nodes. Cloudy swelling of the liver and kidneys.

The following notes regarding the pathological changes are extracted from the autopsy protocol:

Thymus Gland.—Is much enlarged, reaching to the base of the heart. It measures 5 x 3 cm. x 8 mm. On section it presents a normal appearance.

The mesenteric glands are enlarged, the largest of them measuring about 5 mm. in diameter. Some are firm and pale, others congested.

Intestines.—The mucous membrane is pale. In the ileum the Peyer's patches and solitary follicles are somewhat enlarged. The enlargement of the lymphatic apparatus is slight. The solitary follicles in the large intestines are slightly enlarged.

The spleen measures 4 x 3 x 1.5 cm. The surface is smooth. The consistency quite firm. On section the pulp is not increased, the trabeculæ are prominent, the Malpighian bodies are not visible.

The remaining organs showed nothing of importance.

Cultures are negative except that a few isolated colonies of the staphylococcus aureus were isolated from the lung.

Microscopic—

Thymus Gland.—Hyperplasia of the lymphoid elements is present. There is some proliferation of the endothelial cells lying along the trabeculæ. Degenerative changes in Hassal's corpuscles are marked.

Lymph Glands.—There is hyperplasia of the lymphoid structure and increased size of the germinal centers with swelling and proliferation of their constituent cells. There is swelling of the endothelial cells along the trabeculæ.

Spleen.—There is a slight general increase in the finer trabeculæ. Dilatation of the blood spaces is present with increase in the phagocytic cells of the organ. There are marked changes in the Malpighian corpuscles in the form of great proliferation of cells similar to those seen in the germinal centers of the lymph glands. A slight amount of degeneration of the proliferated cells is present.

The other organs, aside from cloudy swelling of the liver and kidneys, are normal.

Case II.—Male child, three months of age; St. Margaret's House; service of Dr. T. M. Trego. The child, who was apparently healthy, was found dead in bed. The autopsy was made twelve hours after death.

The *anatomical diagnosis* was: Enlargement of the thymus gland. General lymphatism. Cloudy swelling of the liver and kidneys. Slight congestion of the right lung.

The following notes are abstracted from the autopsy protocol:

Thymus Gland.—Is much enlarged. It extends from the episternal notch downward and covers the upper half of the precordia. It is pale and cloudy looking on section. It contains no hemorrhages. It measures 7 x 6 x 1.5 cm.

Mesenteric lymph nodes are considerably enlarged, soft, and on section pale gray in color.

Intestines.—The mucous membrane of the small intestine is pale. In the large intestine the solitary follicles are enlarged.

The Spleen.—Is free from adhesions. Measures 6.5 x 4 x 2.5 cm. The capsule is smooth, the consistency about normal. On section the pulp is not increased, the Malpighian bodies are prominent.

The remaining organs showed nothing beyond the lesions mentioned in the anatomical diagnosis.

Cultures were negative.

Microscopic—

Thymus.—Marked hyperplasia of the lymphoid tissue is present.

Lymph Glands.—The germinal centers are prominent and show proliferation of their constituent cells with some swelling of the proliferated cells and slight degenerative changes. The gland tissue is hyperplastic.

Intestine.—Changes in the lymphatic apparatus, similar to those described in lymph glands, are present.

Spleen.—There is proliferation of the cells in some of the Malpighian bodies similar to those seen in the germinal centers of the lymph gland.

CASE III.—Male child, aged 18 days. Albany Hospital; service of Dr. W. H. Happel.

A male child, apparently healthy and weighing 6½ pounds at birth, continued to gain weight up to the 14th day of his life. On the morning of the 14th it was noticed that he had made no gain in weight but seemed otherwise well. At 4 P. M. he was found cyanosed at his mother's breast. He was unconscious, with crowing inspiration. The reflexes were abolished. The pulse was slow and gradually became slower. The respiration became quicker and shorter, and then both pulse and respiration ceased. The child became rigid, cyanotic and pale. The thorax was arrested during inspiration. The child became limp. After about thirty seconds a loud inspiratory shriek ushered in the respiration and the heart beats, completing a marked attack of laryngismus stridulus. The attacks were repeated several times, the child never becoming conscious in the intervals. Death occurred seven hours after the onset of the first attack. The autopsy was performed seven hours after death.

The *anatomical diagnosis* was: Enlarged thymus gland, pulmonary œdema. Cloudy swelling of the liver with angiomata.

The following notes are abstracted from the autopsy protocol:

The thymus gland is much enlarged, measuring 5.5 x 4 x 2 cm. It extends well into the left pleural cavity reaching to the lower border of the third rib; it is composed of two distinct lobules. The capsule and gland are normal on section. The larynx and trachea show no evidences of compression.

The *lymph glands* posterior to the œsophagus are moderately enlarged.

The Intestines.—The mucous membrane shows patchy congestion. The follicles of the large intestine are enlarged.

The Spleen.—Measures 5.5 x 3.5 x 1.5 cm. The capsule is smooth, the consistency is normal. On section the Malpighian bodies are visible, and slightly enlarged.

Both lungs show a moderate amount of œdema.

The remaining organs are free from changes except those noted in the protocol.

Cultures showed the presence of a few colonies of the pneumococcus in the lung. The other organs were sterile.

Microscopic—

Thymus—There is well-marked hyperplasia of the lymphoid tissue. Some endothelial proliferation along the trabeculæ is noted. Degenerative changes in Hassal's corpuscles are present.

Intestines.—There is hyperplasia of the lymphatic apparatus with proliferative changes in the cells of the germinal centers.

Spleen.—There is hyperplasia of lymphatic apparatus. Proliferation of the cells in the Malpighian bodies like that described in the other cases is present.

Lung.—Moderate œdema and congestion are present.

CASE IV.—Illegitimate female infant, five months of age. St. Margaret's House; service of Dr. H. L. K. Shaw.

She was found dead in bed by the nurse. She had lost weight since her entrance on November 12, 1900. On the night of her death she slept well until 4 A. M.; at 5 A. M. she refused her nourishment, and she was found dead at 5.30 A. M. Autopsy 10½ hours after death in cold weather.

Anatomical Diagnosis.—Marked hyperplasia of the thymus gland, with so-called thymus abscess in the left lobe. Enlargement of the mesenteric lymph nodes. Swelling of the spleen. Cloudy swelling of the liver and kidneys. Congestion and œdema of the lungs. Subpleural hemorrhages. Slight swelling of Peyer's patches.

The following notes are abstracted from the autopsy protocol:

The thymus gland is enlarged, covering at least one-half of the præcordia and reaching to within two centimeters of the diaphragm. The organ consists of two large lateral lobes, and between these two above is a triangular area of gland, also made up of two lobes. The left lateral lobe measures 5 x 3.5 x 1.3 centimeters. On section the gland tissue is very succulent. There is a smooth walled cavity .5 cm. in diameter in the interior of the left lateral lobe from which an opaque yellowish-gray fluid can be squeezed.

Lymphatic Apparatus.—The bronchial glands are enlarged, as are the mesenteric glands, both being normal in appearance. The Peyer's patches of the small intestine are slightly enlarged.

Spleen.—Is free from adhesions. The capsule is smooth. The organ measures 7.5 x 4 x 2 cm. There are a few subcapsular hemorrhages. On section the pulp is somewhat increased. The Malpighian bodies are prominent.

The other organs show nothing beside the lesions mentioned in the anatomical diagnosis.

Cultures were negative.

Microscopic—

Thymus.—There is hyperplasia of the lymphoid elements. Degenerative changes in Hassal's corpuscles are present.

Lymph Nodes.—There is hyperplasia of the lymphoid elements. The germinal centers are prominent. There is marked proliferation of the cells of the germinal centers, particularly in the centers of the areas. The proliferated cells are at times swollen and some have undergone degeneration.

Spleen.—The Malpighian corpuscles show a pallor of their centers, which under the high power is seen to be due to proliferation of the cells in the center of the corpuscles, associated with some swelling and degeneration.

CASE V.—Illegitimate male child, two and one-half months of age. St. Margaret's house; service of Dr. Shaw.

The child did well after entrance and gained weight steadily. He was seen on the evening of his death at 7.30 P. M., when he looked well; when visited again at 9.30 P. M. he was found to be dead. The autopsy was made eighteen hours after death in fairly cool weather.

Anatomical Diagnosis.—Hyperplasia of the thymus gland with general hyperplasia of the lymphatic apparatus (status lymphaticus). Cloudy swelling of the liver and kidneys. Congestion of the lungs.

The following notes are abstracted from the autopsy protocol:

The ***thymus gland*** reaches from a point 1 cm. above the episternal notch to within 2 cm. of the diaphragm in the middle line. The organ measures 7 x 4 x 1.5 cm. On section it is normal in appearance.

The spleen measures 6 x 4 x 1.5 cm. The capsule is smooth. The consistency is rather soft. On section the pulp is normal. The Malpighian corpuscles are distinctly swollen, quite prominent.

Glands.—The mesentric lymph glands are distinctly enlarged. The largest one measures 1.5 cm. in its longest diameter. They are normal looking on section. The cervical glands are slightly enlarged.

Intestines.—The lymphatic apparatus just above the valve and in the large intestine is slightly swollen.

The *tonsils* are slightly enlarged.

Cultures show the presence of the staphylococcus pyogenes albus and the pneumococcus in the lung. The other organs are sterile.

Microscopic—

The *thymus* shows hyperplasia of its lymphoid elements. The corpuscles of Hassal show the usual degenerative changes.

Lymph Glands.—A general hyperplasia is present and also focal lesions in the germinal centers in the form of marked proliferation of the clear cells. Occasional degenerated cells are to be seen.

Spleen.—The changes are limited to the Malpighian corpuscles. The centers show marked cellular proliferation with some degeneration. In a few places the vessels show proliferation of their lining endothelium.

CASE VI.—Female child, ten months of age. Private case of Dr. G. E. Lochner.

The mother of an apparently healthy female child, ten months of age, was in the habit of putting her to sleep in a baby carriage on the veranda while she attended to her household duties. On March 16, 1903, she followed her usual custom. While working near an open window in the neighborhood of the baby carriage she heard the child move, and, looking out at her, saw her struggling. Thinking that she was merely struggling in her sleep she avoided going very close to her, but on returning and looking at the child a few minutes later she found her dead.

The autopsy was made 24 hours after death in cool weather.

Anatomical Diagnosis.—Hyperplasia of the thymus gland with so-called abscess of the thymus. General lymphatism most marked in the lymphatic apparatus of the mesentery and intestine. Swelling of the spleen. Cloudy swelling of the liver and kidneys.

The following notes are abstracted from the autopsy protocol:

The *thymus gland* is enlarged extending well down over the base of the heart. Its average measurements are 8 x 4.5 x 1.5 cm. It weighs 27 grammes. It consists of two distinct lobes, in one of which is a smooth walled cavity, containing what looks like hemorrhagic pus. The gland otherwise appears normal, though rather succulent.

Lymphatic Apparatus.—The bronchial glands are enlarged and succulent. The mesenteric lymph nodes are many of them enlarged, pale and succulent. The lymphatic apparatus of both the large and small intestine is exceedingly prominent. Peyer's patches stand out prominently. The solitary follicles appear as whitish, opaque, rounded nodules projecting distinctly from the surrounding mucosa which is quite pale.

The *spleen* is free from adhesions. It is softer than normal, but not increased in size. On section the pulp is increased, the Malpighian bodies are not particularly prominent.

The other organs show nothing beyond the changes noted in the anatomical diagnosis.

Microscopic—

Thymus.—There is marked hyperplasia of the lymphoid tissue. Degenerative changes in Hassal's corpuscles are present.

Glands.—There is general hyperplasia. Marked proliferative changes in the germinal centers with slight degenerative changes are noted.

Spleen.—There is marked hyperplasia of the Malpighian corpuscles which are diffuse. Slight proliferative changes are seen in the centers of some of the Malpighian bodies.

Group 2.—Cases of Infection Modified by Status Lymphaticus.

Case VII.—Male, thirteen years of age. Private practice of Dr. W. O. Stillman.

The patient, a boy of thirteen years, accidentally wounded himself on the inside of one of the fingers of the right hand while discharging a toy pistol July 3, 1900. The wound was a very slight one and attracted but little attention. It was treated with ordinary home remedies and appeared to be doing fairly well, although there was a very slight discharge from it. The patient remained in good health until Friday, July 6, when he complained of headache, chilliness, general malaise and sore throat. He was seen on Friday evening by a physician, who administered some palliative remedies. The patient had a very restless night Friday night, complained of most intense headache, pain in the back of his neck, as well as general aching through the muscles of the back, arms and legs. The temperature on Friday was somewhat elevated, between F. 100° and 101°. On Saturday morning the patient appeared to be somewhat worse, the temperature was in the vicinity of 101° F., the throat was quite sore and the tonsils decidedly swollen. The headache and other pains were about the same. The case was regarded as one of tonsilitis and treated as such. The patient's symptoms became somewhat worse during the day on Saturday, and he passed an extremely restless and uncomfortable night Saturday night. Saturday afternoon he complained of some difficulty in opening the mouth, which at the time was attributed to the swollen tonsils. The difficulty became worse during the night, and on Sunday forenoon, about 10 o'clock, all of the patient's symptoms having become decidedly worse, he was suddenly seized with opisthotonos, and died in a few minutes.

The autopsy was done on the morning of the following day, Monday, by Dr. Elting.

Anatomical Diagnosis.—Wound of the left index finger. Tetanus. Enlarged persistent thymus. Cloudy swelling of liver. Congestion and cloudy swelling of the kidney. Acute spleen tumor. Hypostatic congestion of the lungs.

The following notes are abstracted from the autopsy protocol:

Over the middle phalanx of the left index finger on the inner side is a small ulceration 8 millimeters in diameter extending into the subcutaneous tissue, from which there is a slight purulent exudate.

Thymus.—Is persistent and enlarged, measuring 9 x 6 cm. in its greatest diameters. It presents two well-marked lobes. On section the gland presents at the tip of each lobe a small cavity about 1.5 cm. in diameter, containing a small amount of serous fluid; otherwise the tissue of the gland is normal in appearance.

Spleen.—It is free from adhesions. Measures 14 x 8 x 4 centimeters. The consistency is somewhat diminished, the Malpighian bodies are visible, the pulp increased and softened, the trabeculæ normal.

Glands.—The mesentric are slightly enlarged, pale and homogeneous in appearance.

Cultures from the finger wound showed the staphylococcus pyogenes aureus and the colon bacillus; the same organisms were isolated from the throat.

Cover-slips from the finger wound showed numerous typical drum-stick tetanus bacilli with spores.

Microscopic—

Thymus.—There is hyperplasia of the lymphoid tissue with swelling and proliferation to the endothelial cells along the trabeculæ. Degenerative changes in Hassal's corpuscles are present.

Lymph Glands.—There is a marked general hyperplasia. Slight proliferation in the cells of the germinal center is apparent.

Spleen.—There is hyperplasia of the lymphoid tissue of the Malpighian bodies. There is dilatation of the blood spaces with blood. There is an increase in the phagocytic cells of the organ.

Case VIII.—F. S., male, thirteen years of age. Albany Orphan Asylum; service of Dr. T. M. Trego.

His family history is unknown. Personal history: He was never a strong child. He could not run around and take violent exercise with other boys of his age without becoming short of breath. His only illness was measles one year before his death. He was feeling perfectly well on the day of his death. After his evening meal he became cyanotic, had one or two general convulsions and died in fifteen minutes.

Autopsy seventeen hours after death. Cold weather.

Anatomical Diagnosis.—Great enlargement of the thymus gland with general lymphatism. Acute bronchitis with congestion of the lung. Cloudy swelling of the liver. Congestion of the kidney. Chronic gastritis with dilatation of the stomach. Meckel's diverticulum.

The following notes are abstracted from the autopsy protocol:

Thymus Gland.—Much enlarged, reaching to within 3 centimeters of the diaphragm on each side. It consists of three lobes, a central one in the shape of an elongated oval, measuring 6.5 x 3 x 1 cm., and on each side of this two triangular lobes with their bases at the neck and their apices and bodies lying over the pericardium; each of these bodies is 3.5 centimeters wide at the base, 10 centimeters in length and 1 centimeter in thickness. On section the substance of the gland appears normal.

Lymphatic apparatus.—The mesenteric glands are swollen and pale. The tonsils are much enlarged. The follicles at the base of the tongue are enlarged, and the intestinal lymphatic apparatus is swollen and prominent.

Spleen.—Is free from adhesions. The surface is smooth; consistency softer than normal. The Malpighian corpuscles are prominent. The pulp is slightly increased.

The other organs show no changes beyond those noted in the anatomical diagnosis. The central nervous system is normal.

Cultures show a general streptococcus infection, the organism was isolated from the lung, liver, thymus and kidney.

Microscopic—

Thymus.—Hyperplasia of lymphoid tissue. Increase in polynuclears. Degenerative changes in Hassal's corpuscles.

Tonsil.—Hyperplasia of lymphoid tissue. Marked increase in size of germinal centers. Proliferative changes in germinal centers. Slight degenerative changes. A few areas of necrosis with polynuclear infiltration.

Glands.—Hyperplasia of the lymphoid tissue. Proliferative and degenerative changes in germinal centers.

. . . *Lung.*—Bronchitis and peribronchitis.

Group 3.—Death Under Chloroform in the Status Lymphaticus.

Case IX.—M. E. C., aged seven. Albany Hospital; service of Dr. W. G. MacDonald.

The family history is negative. The child has had mumps, measles and chicken-pox. Several months ago she had an ulcerated tooth. Later she developed swelling of the face, with a temperature of F. 105° and convulsions. She was brought to the Albany Hospital, and the signs of necrosis of the jaw were detected. She was operated on for the removal of a sequestrum from the lower jaw, and when the operation, which was not a severe one, was almost completed she suddenly stopped breathing. All attempts at resuscitation failed, even tracheotomy.

Autopsy two hours after death in cold weather.

Anatomical Diagnosis.—Hyperplasia of the thymus gland with general lymphatism. Cloudy swelling of the heart muscle and kidneys. Fatty infiltration of the liver.

The following notes are abstracted from the autopsy protocol:

The *thymus gland* is greatly enlarged, extending downward and covering the superior two-thirds of the præcordia. It measures 14 x 10 x 2 centimeters and weighs 30 grammes. On section it is normal in appearance.

Lymphatic Apparatus.—The mesenteric glands are enlarged throughout—some pale, others congested. The bronchial glands are enlarged and congested. Peyer's patches are considerably enlarged and congested, but not ulcerated.

Spleen.—Is not enlarged. Consistency softer than normal. On section the Malpighian bodies are swollen and prominent.

The other organs showed nothing but the changes noted in the anatomical diagnosis.

Cultures were all negative, except the culture from the lung, which showed two organisms: (1) the diphtheria bacillus, (2) a bacillus of the B. mucosus capsulatus group. Both organisms were tested on animals and found to be non-virulent.

Microscopic—

Thymus Gland.—The gland shows marked hyperplasia of the lymphoid tissue. There are very few Hassal's corpuscles left, and these are degenerating.

Glands.—There is a general hyperplasia of the lymphoid elements. Proliferative and degenerative changes are present in the germinal centers.

Spleen.—Proliferative changes in the centers of the Malpighian corpuscles, accompanied by slight degenerative changes, are present.

Changes in the intestinal lymphatic apparatus, similar to those observed in the lymph nodes, are present.

EDITORIAL

A NEW PEDIATRIC JOURNAL.

Many of our readers will remember that in the early days of PEDIATRICS a special European edition was published in London. This was in 1896, but for one reason and another it failed to flourish in its English field, although at home it grew to be the leading journal in the specialty.

It was our fortune at that time to be associated with Dr. George Carpenter, whose name still is to be found on our editorial page, as collaborator, and we tender our most hearty congratulations to him in his new venture, The *British Journal of Children's Diseases,* the first number of which appears in January, 1904.

Dr. Carpenter in his introductory speaks of the early struggles of Pediatrics in England and frankly admits the leading position taken by American pediatrists. "The Americans," he says, "at this time, be it understood, were far in advance of Englishmen in all matters relating to children's complaints"—a position that we think the American pediatrist of today holds in respect to the world at large. There is no country in which pediatric work is so well supported and where it is taken up from so many sides as here.

We are the more pleased to see this new journal, recognizing in its birth the awakening of a permanent interest in one [illegible] most important branches of medicine. Given healthy children we cannot fail to have healthy adults, and we welcome all aids in bringing about this desirable result.

We congratulate Dr. Carpenter on the appearance of this new journal, and wish for it a most hearty success.

SUMMER DIARRHEA IN LONDON.

We present as our opening article in this month's number of PEDIATRICS a study on summer diarrhea in London. This careful presentation should be studied in conjunction with the elaborate study of Drs. Park and Holt that appeared in the December number of PEDIATRICS of 1903, as showing the points of resemblance and variation in infant mortality in two of the largest municipalities of the world.

A rapid glance at the figures shows a greater regularity in the curve of rise in mortality in July in London than in New York. This is probably due to the greater fluctuations in temperature of the western metropolis, for as is well known in New York, there is no fixed relation of the four summer months the one to the other; while August is usually the worst month, high temperatures and great humidity may occur at any time after the 15th of June, and may persist until well into September.

The London figures show, as do our own, that temperature is not the only factor; nor is heightened humidity alone responsible for the rise in morbidity. Certain stress is laid on the question of infectivity by the author, but he does not develop his idea as thoroughly as we believe he could; for we believe that the factor of house to house contagion is one of the most important features in the spread of this dire disease.

Very properly attention is called to the food supply, and the milk receives a certain share of attention. When London makes as careful a survey of its milk problem as has Drs. Park and Holt for New York, we hope to obtain some studies that will guide pediatrists in the better control of summer diarrhea.

ABSTRACTS

A Case of Splenic Leukemia in a Young Child.—Dr. John McCaw (*The Practitioner,* October, 1903, p. 575) reports this case, giving the family history and the child's state from admission to death. He comments that this case, which ran its course in about six weeks, is an example of a very acute type of splenic leukemia. The appearance of the child on admission to hospital was sturdy and well developed, and no one would have imagined that she was suffering from a severe blood disease. The examination of the blood, however, disclosed a condition which was a great surprise, and enabled the diagnosis to be made in favor of leukemia rather than of lymphadenoma. The extreme fretfulness and restlessness he attributes to the condition of the medullary substance of the long bones, which was probably undergoing rapid degenerative changes. A very noticeable feature was the considerable diminution in the size and hardness of the spleen before death. The lymphatic glands also became much smaller and harder. These conditions the author is unable to explain.

Adeno-Carcinoma of the Liver.—Dr. Stephen S. Burt (*The Post-Graduate,* November, 1903; p. 991) reports a case, probably primary, in a boy twelve years of age, in whom death occurred forty-five days from the invasion. A sample of one of the tumors, removed from the liver in position post-mortem, under the microscope showed the typical histologic structure of adenocarcinoma, though the short duration of the disease and the age of the patient would tend to cause doubts which cannot be solved owing to the fact that no necropsy was obtained.

Bloodless Reposition of Congenital Dislocation of the Hips, with a Report of Cases.—The cases reported by Davis (*American Journal of the Medical Sciences,* October, 1903; p. 608) were all subject to forcible correction two to five years ago. Case I. was a boy of three years; case II. a girl aged four years; case III. a girl aged three years; case IV. a girl aged eight years. To sum up, out of seven dislocated hips in four patients, one was operated on and one was lost sight of while under treatment. Of the other five two were anterior transpositions, and three were apparently perfectly normal in every way five years, two and a half years, and the last six months, after replacement by manipulation. Of the two anterior transpositions, one was a single dislocation in a boy, with a twisting of the neck of the femur, and, while some shortening and limp remained after two years and five months, the result has been satisfactory because the head had become fixed and the centre of gravity thrown farther posteriorly. The other transposition occurred in case II., a double one, in which the other hip remained reduced in the acetabulum.

As regards the method of reduction, the writer finds it too intricate a subject to discuss in limited space; but he states that these hips were practically all reduced by the method of circumduction as practised in traumatic luxations and as applied to congenital and pathological luxations by Paci, of Pisa, since 1888, with the addition of tenotomy of the abductor longus tendon. In inquiring into the results of the method by forcible reposition, it is essential, he says, that it be borne in mind that different operators have different standards of what constitutes a cure. He then enumerates results, good and bad, that are sometimes obtained by different methods, and concludes with the statement that the fact that deformities of the head, neck and acetabulum may exist, should cause one to be guarded in promising as to the results to be achieved by treatment in any given case.

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Congenital Luxation of the Ankle.—In all of its physical characters this case corresponds to an incomplete form of the so-called "Volkmann's Congenital Ankle Deformity," and Dr. Freiberg (*Annals of Surgery*, October, 1903; p. 545) believes that this case seems to corroborate the theory of amniotic pressure in the production of defective fibulæ and the deformities thereupon consequent.

This case the author finds of especial interest, because the fibula is present throughout its course, being possibly thicker than normal, and because it seems possible to draw rather definite conclusions from it regarding the etiology of this whole group of cases.

Epidemic Pneumonia.—An epidemic of lobar pneumonia is described by F. Spaet (*Münch. med. Woch.*, Sept. 29 and Oct. 6, 1903), which was peculiar in that it occurred in a small country town where the hygienic conditions were excellent. Within two months 13.9 per cent. of the inhabitants had been affected. The course and physical signs were typical and in general severe, yet fatal cases and complications were rare. Epidemics of pneumonia are not common and generally occur where many people are herded together or else are secondary to influenza and then more irregular in type and marked by severe pains in the limbs and vomiting. One is forced to conclude that genuine lobar pneumonia is occasionally a contagious disease, though the conditions which enable it to spread are still unknown.

Bladder Center in the Cortex.—The fact that children obtain full control over the bladder only as their intellectual faculties develop, makes it probable that a cortical center controls the innervation, besides the lower centers in the cord and sympathetic ganglia. Almost conclusive proof is offered by a case of M. Friedmann (*Münch. med. Woch.*, September 15, 1903). A boy sustained a fracture of the vertex of the skull without any focal symptoms, except that there was at first a difficulty in urination and, later, incontinence, which persisted for over a year. The site of injury corresponded to the upper third of the posterior central convolution, directly behind the arm center. Why the other hemisphere did not assume vicarious function could not be explained.

Relation of the Public School to the Seminary and College as to Psychoses.—This topic is an important one to the educator and to the parent or guardian of the growing youth of our fair land—America—which he claims so justly to be a leader in earthly pursuits; and in consideration of this subject, Dr. Pearce (*The Journal of the American Medical Association,* November 14, 1903; p. 1177), directs his attention to the overwrought child of the cities. He has observed a wide variance in the methods of instruction, due to idiosyncrasies of a school board or trustees; and a great many times psychoses in children and early adult life can be laid at the feet of the practitioner who failed to advise the parents, where a child is becoming nervous from misdirected instruction and overwork of the nervous system. The average child, he is sure, is forced too much. He recommends that one session only be held each day, or, if two, that the second be devoted to natural history or gymnastics. Better be that the child have a superabundance of fresh air and physical exercise than a doubtful mental advancement. The conditions are better in academies and preparatory schools than in high school or even in college. The author of this paper has endeavored to enforce what he feels to be a certain truth from observation through practising neurology; i. e., that students of the United States generally are much overwrought. The essential point in his observations is to emphasize the need of medical attention to the subject.

Hydrotherapy in Acute Infantile Gastro-Enteritis.—In the treatment of acute gastro-enteritis P. ADOLPHO (*Gazz. Osped.*, Aug. 30, 1903) has found his greatest success in placing the entire alimentary tract in a condition of complete rest by withdrawing all food during a period of from twelve to thirty-six hours, and administering, during that time, nothing but boiled water—cooled and kept in a closed vessel—in large quantities, divided in frequent small doses. The effect of water thus given, he claims, is manifold; a detergent influence being exerted thereby upon the intestine, which is the site of digestive engorgement; the irritability of the mucosa being allayed and the great thirst which is present appeased. Moreover, water treated as described is a poor medium for the development of bacteria. The author states that all diarrheas of dietetic origin invariably yield to this line of treatment and that vomiting also promptly yields to its influence.

Fallacies of the Widal Reaction.—It is well known that a small amount of bile in the blood will give a positive agglutination, even in patients not suffering from typhoid. F. KÖHLER (*Munch. med. Woch.*, Aug. 11, 1903) could even bring about an artificial agglutination by ligating the common bile duct and by injecting taurocholic acid into the blood. There is no doubt that normal serum, and more often the serum of patients suffering from blood-diseases or from disturbances of the liver with jaundice, will cause clumping of typhoid bacilli in relatively high dilution. Human bile, even when heated for two hours at 60° C., and taurocholic acid, when added directly to a culture, will also agglutinate this but the phenomenon is by no means constant. A number of chemical substances such as salicylic acid, safranin, fuchin, etc., will behave in the same way. A positive Widal is, therefore, not pathognomonic for typhoid; it may also be due to (1) disease of the liver with biliary stasis and bile in the blood; (2) chemical substances; (3) infection with the colon bacillus; (4) rarely other infections such as with the pneumococcus and meningococcus.

Aphasia after Scarlet Fever.—Disturbances of speech are rather rare complications or consequences of scarlatina, and some authors fail to mention them at all. Statistics of such proportions as 6,000 cases of the disease in the St. Petersburg City Hospital; 3,000 cases in the Children's Hospital, and others do not contain a single case with such complications. The case reported by S. N. CHEREPIN (*Prakt. Vrach*, No. 34, 1903) was that of a little girl of five years in whom the attack of scarlatina was rather of a severe character, with distinctly pronounced typhoid symptoms. On the tenth day of the disease while perfectly conscious she lost the power of speech. Examination of the nervous system elicited paresis of the right arm and leg. She understood what was said to her and responded by various movements, opening her mouth, protruding the tongue, etc. She was entirely unable either to speak at will or repeat anything spoken to her, or produce any articulate sound. These disturbances lasted for a few days when they disappeared gradually. Patient began first to move her lips, and later produced articulate sounds, and on the seventeenth day the power of speech was restored in its entirety. This symptom complex of disturbed speech in combination with paresis points to an affection in the region of the left frontal convolution, in its posterior portion, the motor center of speech, and further in the direction of the internal capsule. The affection bears the character of cortical motor aphasia due likely to a more or less extensive hemorrhage or embolism, more probably the latter. On the other hand, it is possible to assume the whole clinical picture as one of motor subcortical affection, in which case hemorrhage must be considered as the more probable cause.

Physiological Cholemia of the Mother and New-born.—The comparative study of the blood of the mother, new-born and umbilical cord, by A. GILBERT, P. LEREBOULLET, and MLLE. STEIN (*Annales de Gynéc. et d'Obstet.,* July, 1903), shows that the blood of the cord contains three times as much biliary pigments as the maternal blood, and the blood of the new-born contains one-third as much more biliary pigments than that of the cord. There is therefore a physiological cholemia of the new-born, of marked intensity, although remarkably well borne, and it is this which gives rise to the secondary cholemia of the mother.

Unclean Milk, Bovinine Tuberculosis and the Tuberculin Test.—The relation of this subject to the public health is discussed by LARNED (*Boston Medical and Surgical Journal,* Nov. 19, 1903; p. 563), who quotes the suggestion, of Heath of Buffalo, relative to the fortification of existing laws relating to the milk industry. They are: (1) Prohibition of sale of milk over thirty-six to forty-eight hours old. (2) Prohibition of disinfectants. Milk-house conditions must preclude their necessity. (3) Supervision of contagious diseases as to milk routes. (4) Abolition of street peddling and grocery store dealers. (5) Sterilization at dairy and preparation for ultimate delivery with labels of data. (6) Arbitrary attitude towards dairies supplying cities and over which no jurisdiction exists. He then quotes Pierson, Assistant Chief Dairy Division, Department of Agriculture, who gives the following as the ordinary conditions that should be found in every well-managed dairy: (1) A roomy, clean, dry, light and well-ventilated cow stable. This is absolutely necessary to keep cows in the best of health. (2) Healthy and clean cows which appear well fed and contented. (3) Abundance of pure water given to the cows at least twice daily. (4) Feed of good quantity. The food must be free from dirt, decay or a musty condition. (5) A spirit of kindness toward the stock by every one employed about them. (6) Provision for aërating, straining and cooling the milk, in a clear atmosphere free from all stable odors, immediately after being drawn from the cow. (7) Provision for washing and sterilizing all utensils which come in contact with the milk. (8) Facilities for storing the milk and keeping it cold. To show that these are not simply theoretical and visionary possibilities, the brilliant example of the Royal Danish Veterinary School may be cited, he says. In our own immediate neighborhood several instances of voluntary improvement have demonstrated that even with the increased cost of production and increased selling price there is still a good chance of success, and that in the end the intelligent consumer will appreciate the honest efforts expended in his behalf. Recently the author made some cultural experiments with milk sold in the city of Joliet, and he gives the results according to notes made at the time.

Digestion of Milk.—Concerning the digestion of milk, RICHTER (*American Medicine,* Oct. 31, 1903; p. 704) recapitulates what milk is. Milk, especially cow's milk, is a liquid consisting on an average of 87 per cent. of water and 13 per cent. of solids.

The solids are:

Butter fat, present in a fine emulsion	3.7 per cent.
Proteids: Casein, not in solution, but like imbition, soaked in the liquid (similar to gelatin)	3.0 per cent.
Lactalbumin	0.5 per cent.
Sugar of milk	4.9 per cent.
Mineral salts (K_2O, Na_2O, CaO, MgO, F_2O_3, P_2O_5, chlorides), total	0.75 per cent.

And varios extractives and enzymes, not yet isolated.

Milk contains also certain ferments, which, however, have as yet not been isolated. They are: (1) Milk trypin, or galactose, a proteolytic enzyme dissolving casein and rendered inactive at a temperature of 76° C. (2) Milk catalose, decomposing hydrogen dioxid; rendered inactive at a temperature of over 80° C. (3) Milk peroxidose, an anerobic enzyme, which transfers oxygen upon other bodies while it abstracts oxygen from superoxids; rendered inactive at 85° C. Milk is apt to contain microorganisms. Fresh milk, he states, contains a number of bacteria. Pathogenic bacteria are very frequently found also, which latter are destroyed by the products of metabolism of the lactic acid bacteria. To render milk inoccuous for children, it is either boiled or sterilized. As the exclusive food of infants, it contains all the nutriment necessary for them, in proper proportions. Saliva has no important action on milk. Its digestion commences in the stomach, and requires more time than meat. It coagulates in the stomach by the action of the hydrochloric acid and of the renin. An exclusive milk diet results in a loss of the nitrogen (proteids) ingested, of 12 per cent., and fat is more thoroughly used up. The addition of bread, for an adult, causes the milk to be more thoroughly exhausted by digestion. The author goes into great detail, and states in conclusion that when preservatives are used the mortality has decreased to a marvelous degree, and where the most stringent milk laws are enforced, the mortality rate remains alarmingly high, artificial infant foods adding to this effect.

Ileo-Colitis.—This article, by DR. L. L. MEANES (*Interstate Medical Journal,* September, 1903; p. 473), deals with this condition as seen in children. Its causation, i. e., improper diet, and insufficient ventilation; pathology; symptoms,—the characteristic stool of "washed meat" appearance, and painful tenesmus; prognosis, and treatment are dwelt on. In summing up, the author says that hygienic and dietetic treatment are of major importance. The drugs can only control the symptoms; the cure must be brought about by the proper diet.

Gonorrhea in Infants, with a Report of Eight Cases of Pyemia.—DR. REUEL B. KIMBALL (*Medical Record*, Nov. 14, 1903; p. 761), from his studies, comes to the following conclusions: (1) Gonorrhea prevails among infants and children to an extent not fully appreciated by the medical profession at large, and has become an epidemic in institutions where numbers of children are placed together. (2) The ordinary clinical forms which the gonococcus infection assumes in children are ophthalmia, vulvovaginitis, and pyemia; (3) a series of cases of pyemia, reported in this paper, occurred in infants, in whom no local lesion could be found to explain the mode of entrance of the organism to the general circulation; (4) the suggestion is made, that from a stomatitis due to the gonococcus, such a systemic infection may arise. Gonorrheal stomatitis in infants is a disease that needs further study; (5) only by careful exclusion, by microscopical examination, and by complete isolation can this disease be absolutely debarred from a hospital where infants are cared for. (6) There is urgent need of public enlightenment on this subject. Those in charge of institutions for children, trained nurses, and even parents, should be taught the frequency and virulency of this infection and the ease with which it is spread. It should be the duty of health authorities to include gonorrhea among the acute infectious diseases of children; the author gives detailed histories of eight cases of pyemia. In these eight cases of pyemia there was no local infection which could be considered to form a starting point for the disease.

Aristochin in Pertussis.—The new quinine preparation, aristochin, has been successfully employed by H. KITTEL (*Therap. Monatsch.*, Aug., 1903), in 34 cases of pertussis. The duration of the disease was materially shortened, especially in children under one year, and early cases were almost aborted. Digestion is never disturbed, and the entire system seems to be toned up. Children under one year receive three times a day as many centigrams as they are months old up to one decigram; older children three times a day two decigrams.

Occurrence of Bacteriuria.—The occurrence of idiopathic inflammation of the bladder in children is certainly rare when one considers that the prominent symptoms—tenesmus with discharge of small amounts of urine free from blood and pus—are rarely overlooked. D. Cnopf (*Münch. med. Woch.*, Oct. 6, 1903) points out that autoinfection plays a prominent part, for the majority of patients were girls suffering from enterocolitis, where contamination of the genitals was hardly avoidable and the short urethra facilitated infection of the urinary passages. With boys, the explanation is somewhat more difficult, but it has been shown that bacilli can readily wander through lesions of the rectum into the bladder. Infection by way of the blood is not yet absolutely proven, though colon bacilli have been found in the circulating blood of infants suffering from enteritis. A bacteriological examination of the bladder-contents in such cases may show the presence of colon bacilli, even if there are no vesical symptoms. There must be some concomitant weakness of the bladder-wall induced by cooling off of the body, retention of urine or general intoxication, especially if the kidneys are much diseased. The symptoms may be very mild or very severe; in the latter case there is high fever, chilliness, nausea and constipation. The abdomen is exceedingly tender and burning, saturated urine is constantly voided in small amounts. On examination it contains albumin, mucus, pus, epithelium and even red blood cells. The colon bacillus, exceptionally the *Bacterium lactis aerogenes* or the *Diplococcus pneumoniae* are found in large numbers. The condition may run its course in one to two weeks, but obstinate recurrences may follow. Ofttimes an obscure temperature-curve is due to this bacteriuria. Serious complications, such as urethritis, pyelitis, nephritis or uremia hardly ever occur in children, but treatment should be prompt and energetic. Urotropin internally is harmless in children and efficient, though it must often be given for weeks. Bladder irrigations with dilute antiseptics are of course in place.

Traumatic Separations of the Lower Epiphysis of the Humerus and Their Treatment by the Extended Position, with Report of Two Cases.—Leading up to his subject, Cottam (*Medical Record*, Nov. 14, 1901; p. 772) remarks that anatomy is a very inexact science,—a fact that is especially apparent to anyone writing of the elbow joint. In considering the subject of epiphyseal separations, it is desirable to have a general understanding of the postnatal development of the part involved. In this instance there are four ossific centers, i.e., one each for the internal and external epicondyles; the trochlea, and the capitellum. That for the capitellum appears about the third year, for the internal epicondyle at about the fifth year, for the trochlea at about the twelfth year, and for the external epicondyle about the fourteenth year. Of especial clinical importance is the extent to which the epiphysis participates in the formation of the olecranon fossa. The author gives as guiding points to the diagnosis of separation of the lower epiphysis of the humerus, (1) the history of the accident; (2) the age of the patient, and (3) the evident location of the injury very close to the elbow. The symptoms are: (1) Early and extensive swelling—which also serves further to obscure the diagnosis; (2) preternatural mobility; (3) deformity, which is readily overcome, but easily reproduced; (4) muffied crepitus—a very suggestive term first used by Poland; (5) shortening of arm; (6) limitation of active movements by pain; (7) ecchymosis about the elbow. A casual survey of the literature shows that writers of the present day are far from being agreed as to the proper angle at which the arm and forearm should be retained after reposition of the fragment. Here a few opinions are appended. Only two cases are given by the writer, being the only two cases of elbow-joint injury which he has treated without some degree of loss of function, both of which were treated by the use of the extended position.

Filling Bone Cavities.—The most successful method heretofore devised for filling up cavities in bone produced by operation or otherwise, has been by means of the decalcified bone plates of Senn. Barth and Valan were able to show, however, that only a connective tissue scar resulted from the implantation of decalcified bone, while the insertion of macerated or calcined bone was followed by the formation of new osseous tissue which completely restored the defect in the skeleton. The activity of the osteogenetic process in the newly implanted area depends mainly on the inorganic bone salts present which are made use of in the formation of the new bone. Valan has also shown that all the calcium salts exert a favorable influence in this process, and the activity of the latter is directly proportionate to the similarity of the chemical relations between the implanted calcium salts and the inorganic substances in the bone. The spongy character of calcined bone also favors penetration by the osteogenetic elements. Practical application of this theory has lately been made by G. FANTINO and A. VALAN (*Archiv f. klin. Chir.*, Vol. 70, No. 3) in some 40 cases where bone cavities existed as the result of necrotomies or tuberculous processes. Complete disinfection of the cavity and then filling it with a 10-per-cent. emulsion of iodoform glycerin. This was brought to a boil by inserting the thermocautery point for a minute or two, and bacteriological examination proved this to be a most effective measure. In clean tuberculous cases the cavity may be filled up at once, but after necrotomies it is better to wait a few days, until it is certain that the wound is running an aseptic course. The authors employed the os spongiosum of the calf in their work, after prolonged maceration and boiling and then calcining. The cavity is entirely filled up so that no vacant spaces remain. In cases where the neighboring soft parts are healthy the wound may be entirely closed by suture, and here the process of substitution has been observed to occupy only four months or even less. In cases of acute osteomyelitis and suppurating tuberculous processes failures were often noted on account of the inability to maintain the asepsis or to completely fill all the crevices. Success was finally obtained with a mixture of the bone ash and a compound of thymol and iodoform (1:2), equal parts. This combination is fluid at 75° C., and of almost stony hardness at body temperature. After six months it was found in one case that the implanted material had largely disappeared, the new growth of bone having almost completely absorbed it. It is important that the wound and its surroundings be kept absolutely dry. In all the cases, taken together, the results were almost uniformly good and the process of replacement was complete in from three to eight months.

The Treatment of Clubfoot Under Three Years.—Nothing more is needed to correct this deformity than a succession of plaster bandages properly applied. A. R. SANDS (*Am. Jour. of Obst.*, Aug., 1903) describes the following method, which he first advocated in a paper read before the Orthopedic Section of the New York Academy of Medicine in 1893: First apply a piece of felt to both the inner and outer borders of the foot, extending it over the malleoli. This is done as an extra precaution for the protection of the bony prominences, being needed especially over the metacarpophalangeal joint of the great toe, and over the cuboid bone—this being usually very prominent. Then apply at least two thicknesses of canton flannel to the foot and leg, extending it to the tuberosity of the tibia. Now, having the foot and leg well protected, the plaster is applied also up to the tuberosity of the tibia. This will prevent the leg from moving in the plaster cast, and give a better leverage when the twisting process is begun. Care should be had to have the toes held in their natural relation to each other. The plaster should extend well over the toes, but their ends should be exposed. While waiting for the plaster to set grasp the leg with one hand, holding it firmly on the table, and with the other hand press on the plantor surface with a board; this serves the purpose of overcoming some of the deformity, and gives a flat surface on which the child can walk better. When ready to begin the redressment, cut out a wedge-shaped piece of plaster on the outer border of the foot over the most prominent part of the deformity, for here the greatest pressure is needed; then connect the upper and lower angles of this cut by cutting a line through the plaster entirely around the foot. Care should be taken not to allow this cut around the foot to be near enough to the heel to allow the front part of the foot to move in the dressing when the foot is twisted, for then the object in view would be defeated. The plaster cast is now in two pieces, each fixed to the foot. By grasping the leg with one hand and the foot with the other, it takes but little force with this leverage to bring the opposite ends of the wedge-shaped cut into apposition, which corrects a certain amount of the deformity. While an assistant holds the parts in a position of their new relation to one another, they are fixed there by a wet plaster bandage applied around the foot and ankle in a figure of eight, care being taken to fill in the gap made by the linear incision on the inner side of the foot. This third plaster bandage, being applied over the dry cast, can be easily peeled off at the next sitting; then make the wedge larger and repeat the dressing as before. This can be repeated three or four times, when it will become necessary to apply a new bandage. The number of sittings will have to be regulated by circumstances, pain, etc. The twisting should be done about three times a week, until the foot is in a normal position, then once a week until the desired overcorrection is obtained; then the permanent dressing is applied. The condition of varus should first be corrected, and then the equinus should be overcome by making the wedge incision over the dorsum of the foot, and proceeding as before. As a rule, it might be said that the foot should be kept in a prominent dressing for at least six months after the child begins to walk. After the dressing is left off a close watch should be kept on the patient, and just as soon as it is discovered that there is a tendency to relapse, the foot should at once be put up in plaster again, or, in whatever retentive apparatus may be selected. The author prefers either plaster or silicate of soda to the brace.

Autolysis in Pneumonia.—Believing that the failure of the exudate to undergo absorption in a case of unresolved pneumonia might lie in an imperfection of the autolytic processes taking place in the inflamed lung, S. FLEXNER (*Univ. Penn. Med. Bull.*, Vol. 16, Nos. 5 and 6), has made a thorough study of autolysis of the lung in pneumonia. That organs protected from decomposition tend to undergo solution by a process of self-digestion was first shown by Salkowsky in 1882, and it is now known that in the intracellular ferments causing autolysis we possess a very potent series of agents which come into play under both physiological and pathological conditions. From the study of a large number of lungs obtained at autopsy the writer has found that it is in the stage of gray hepatization that autolysis takes place quickly and perfectly, while in the stage of red hepatization it is very imperfect. He attributes this to the small number of pus cells present in the latter condition. But if the lung in unresolved pneumonia is exposed to conditions favoring autolysis, the process is slow and incomplete compared with what takes place in gray hepatization. In unresolved pneumonia the absence of reduction of autolysis is an indication of the future fate of the exudate, namely. during life to undergo organization. The exudate in unresolved pneumonia is fibrinous rather than cellular, and many of the alveoli are filled with dense, hyaline, fibrinous masses. This condi causes of defective eyesight in school children, and a definition of the conditions necessary for preserving the sight. (5) An inquiry into the practical knowledge of hygiene possessed by school teachers. There is a multiplicity of causative factors in producing psychoses. The author enumerates the physical defects requiring attention, dwelling on impaired vision; the effects of eye strain on the mental condition; and disorders of menstruation in school girls. In attempting to formulate a plan for the removal of the physical and mental defects thus observed, he suggests: (1) A careful medical inspection of school children at the beginning of their school life and at stated intervals thereafter, covering both their physical and mental capacities. (2) All teachers should be well instructed in the physiology and psychology of the child and in the principles of school hygiene. (3) School buildings and their environments should be made to comply with all the requirements of modern school hygiene, as to light, pure air, temperature, seating, decorations, play ground facilities, etc. (4) The curriculum should be so flexible as to allow more opportunity for the exercise of the individual judgment of the teacher, as to the best method to adopt for each child in order to secure for it the greatest educational value, and the curriculum should include facilities for appealing to the mental faculties along every sensory pathway, among which facilities I would mention nature study, rational kindergarten, manual training and physical exercise. (5) The number of pupils assigned to any one teacher should be only such as she can care for to the best advantage. Time should be allowed the teacher for a careful study of the physical and mental needs of each pupil. (6) A closer relationship between the parent and teacher, with a view of securing the end sought—the highest and most useful development of the child. (7) The removal, as far as possible, of all conditions within or without the school room that interfere with the accomplishment of this purpose.

Changes in the Nervous System in Porencephaly.—The paucity of the cases in which a detailed study of the changes occurring consequent to porencephaly, has been made, imparts considerable value to the investigation made by J. O. W. Barratt (*Journal of Mental Science*, July, 1903) on a case of porencephaly which, without any history of traumatism, began at the age of eleven months with eclampsia, and, with the continuation of this condition, terminated in idiocy. At thirty years of age the patient was admitted to the asylum and died nearly three years afterward. At autopsy the following changes in the nervous system were found: There was a defect in the brain mantle on the left side involving the aperculum, the island of Reil and the superior temporal convolution. The floor of this area was formed by the subjacent white matter which was very defective in medullated fibers. The left hemisphere was small and had contracted upon the area of defect, the left temporal lobe, seen from below, was also defective in size. The inferior longitudinal bundle on the left side was defective. As the destructive lesion of the temporal lobe was confined to the superior temporal convolution, it follows that the defective nerve-fibers arose in this gyrus. The caudate and lenticular nuclei were unaffected. The left optic thalamus was atrophied, the atrophy involving the lateral median and ventral nuclei (especially the latter), while the anterior nucleus was unaffected. The left optic radiation was atrophied. The atrophy of the optic thalamus was entirely dependent on the cortical lesion, being outside the vascular area involved in the latter. The cortico-spinal and thalamospinal tracts coming from the left hemisphere were markedly wasted in the mesencephalon, pons and medulla in comparison with the corresponding tracts of the other side. The cerebellum was normally developed. The spinal cord exhibited a defect of the left antero-internal column, while the right anterolateral column was of defective width opposite the base of the anterior horn. There was also diminution in size of the right anterior horn. The lesion was obviously vascular in origin, corresponding very closely to the area of distribution of the left middle cerebral artery—which must have been blocked just beyond the point at which the lenticulostriate branches are given off. The blocking may have been the result of an embolus deatched from a cardiac valve exhibiting vegetations, for at the autopsy valvular heart disease of old standing was found.

Passage of an Open Safety-pin Through the Intestinal Canal.—Dr. Powell (*Cleveland Medical Journal,* October, 1903) reports this case to illustrate the wonderful possibilities of the average small boy's canal, and to emphasize the importance in such cases of stuffing and the avoidance of cathartics. The pin was swallowed, open, at an angle of 35 degrees. It remained in the child for six days, and, when expelled, the black enamel coating was found to have been entirely eroded by the intestinal secretions.

BOOK REVIEWS

PLAIN HINTS FOR BUSY MOTHERS. BY MARIANNA WHEELER, Superintendent of the Babies' Hospital, New York. E. B. Treat and Company, New York; 35 cents.

This is a small manual that can be safely recommended by the physician to his patients. It is non-technical and well illustrated, and is all that it aims to be; a little handbook intended as an aid to mothers whose means are limited and who must care for their own babies, at the same time attending to their housework. It is written in such a plain and simple manner, that no one could fail to understand its directions. It is full of common sense advice as to general health, clothing, food, bathing, fresh air, etc. Its pages on "Don'ts" are specially practical and helpful. We recommend it most cordially.

A POCKET BOOK OF INFANT AND CHILDHOOD DIETETICS, WITH DIRECTIONS FOR THE HOME MODIFICATION OF MILK. By A. B. Speich, A. M., M. D., Instructor in Medicine, Medical Department of the University of Illinois. E. H. Colgrove, Chicago.

As an aid to the practitioner and a guide to the mother this series of detachable leaflets cannot fail to prove of immense practical service. They save the practitioner's time and is a sure and accurate guide to place in the mother's hand when special diet is called for.

The economizing of time and the definiteness of directions combined make this little handbook worthy of commendation.

PEDIATRICS

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ORIGINAL ARTICLES

TETANUS AND VACCINE VIRUS

BY JOHN H. HUDDLESTON, M. D.

OF NEW YORK.

The 1901 epidemic of tetanus following vaccination brought out the facts that such cases are exceedingly rare, that these rare cases have followed the use of points and glycerinated virus indiscriminately, and that while conclusive demonstration is lacking that the tetanus bacillus has been in any case inoculated with the vaccine organism, the possibility of the combined infection certainly exists. There has, however, been hitherto little or no experimental work on the association of the tetanus germ with vaccine virus, and the following experiments have therefore been made:

(*A*) It is well known, of course, that tetanus germs are found with some degree of frequency in horse manure. It is not known, I believe, how frequently they occur in calf manure. The calves supplied to the Vaccine Laboratory of the New York City Health Department are old enough to have received hay before admission. After admission they are fed on sterilized milk, and may therefore be considered as at least not adding to the tetanus which may have been carried in with the hay. To determine the presence of this infection I have examined the feces of twenty-five calves. A small amount (¼ to 1 Cc.) of the feces passed by each calf immediately after entrance to the stable was mixed with bouillon and incubated for forty-eight hours under hydrogen gas. Two smears were then made and stained from each culture. Microscopical examination showed suspicious spore-bearing bacilli in six—nothing suspicious in the remaining nineteen. The cultures containing suspicious bacilli were heated to 85° for ten minutes, and fresh cultures were made from these into bouillon and incubated under hydrogen gas for another forty-eight hours. Examination of smears from these showed typical spore-bearing bacilli in two cases. Two white mice were injected each with a capillary tube of the culture from the one case, and two other mice in the same way from the other case. The two mice from one case developed typical tetanic spasms in twenty-four hours, and died in forty-eight hours. One of the other mice developed spasms in forty-eight hours and died twenty-four hours later; the other mouse was not affected. For absolute certainty of identification through the toxin these two cultures were planted in two flasks of bouillon, protected by paraffin, and these were incubated for ten days. The flask cultures were then filtered through a Pasteur filter, and of this filtrate in one case ¾ Cc. and in the other ½ Cc. was injected into a white mouse. One mouse died rigid in twenty-four hours, and the other developed typical tetanic spasms in seventy-two hours, and died in twenty-four hours more. It is therefore demonstrated that in two calves out of twenty-five fed with hay, tetanus bacilli have been found in the feces.

(*B*) The calf is not included in the list of animals notably susceptible to tetanus, but in order to learn the degree of immunity one was injected on October 10 with 1 Cc. of tetanus toxin; on the 15th with 5; on the 21st with 10; on the 22d with 15; on the 23d with 20; on the 24th with 25; on the 25th with 35; and on the 28th with 45. The calf showed no evidence of being affected, and as it was conceivable that tetanus antitoxin had been produced by this method of injection, another calf was given 55 Cc. in a single injection. This calf also was unaffected. A third calf was therefore injected with 100 Cc. of toxin, and two days later with all the available store—970 Cc. The toxin used for this experiment was of such virulence that 1-500 Cc. would kill a guinea-pig in forty-eight hours. This injection proved fatal within thirty hours. It may be regarded as proved therefore that calves are so insusceptible to tetanus that if this injection were present in the vaccine vesicles the calf would not present any symptoms to show it.

(*C*) It has been said that if tetanus germs were contained in the glycerinated virus and the latter were placed in sealed glass capillary tubes the tetanus would increase in amount on account of the anaerobic conditions. To test this assertion two flasks of bouillon diluted to the same extent as vaccine pulp is diluted were taken. Into one was put bouillon diluted with three times its amount of water, and the whole covered with paraffin. Into the second, protected in the same way, was placed bouillon diluted with three times the amount of 50 per cent. of glycerin in water. Each flask was inoculated with 1-10 Cc. of tetanus culture, and incubated for three days. The culture in the flask containing bouillon and water grew luxuriantly, and tetanus was demonstrated by smears. In the second flask there was no growth, but the spores were still alive, as was shown by planting from the flask into a fresh tube of bouillon. It is clear therefore that a threefold dilution of 50 per cent. glycerin exercises an inhibiting influence on tetanus even when the temperature is best adapted for growth.

(*D*) It is of interest to know how easily tetanus germs deposited on vaccine virus before collection can be demonstrated in the material collected. A bouillon culture of tetanus forty-eight hours old was smeared on the vaccine vesicles of a calf (986) when they were ripe for collection. No cleansing was done. The vesicles were scarified and ivory points charged from the issuing serum. These were planted in bouillon, incubated under hydrogen, and tetanus germs found. The pulp was then curetted and similar anaerobic cultures made. Again tetanus was demonstrated. The pulp was mixed with glycerin and water in the usual ratio, and a capillary tube of the emulsion was placed beneath the skin of each of two mice. No symptoms of tetanus appeared in either. From the bases of the vescicles, after the pulp had been curetted, additional points were collected. Cultures were made as before, and again tetanus was demonstrated. These demonstations were made from material collected after the tetanus had been added, before the vesicles had been cleansed. Another portion of the area on which the culture had been smeared was then washed as carefully as it would ordinarily be before collection of virus. Exactly similar collections of points and pulp were made again. First points from the surface of the pulp, then pulp, and finally points from the curetted bases of the vesicles were collected and tested by cultures as before for tetanus. All showed typical spore-bearing bacilli on smears from the culture. The pulp was then made into an emulsion and tested on two mice as before, and as before the mice were unaffected. It became clear therefore in the first place that bone points and glycerinated virus may alike carry tetanus; secondly, that the ordinary washing is not sufficient to remove tetanus germs when they are added in considerable amount; and thirdly, that the animal is somewhat less delicate than the cultural test, at least to ordinary tetanus germs.

(E) To learn how much tetanus must be present in vaccine virus to become easily evident on culture, varying amounts of forty-eight-hour tetanus culture were mixed with vacine virus. One, two, and three loopfuls of the culture were added, each amount to one cubic centimeter of vaccine virus. The mixture was stirred with a glass rod for five minutes, and cultures were made, but no tetanus was found. Three mice were injected with the same mixtures and were unaffected. That a small amount of vaccine virus does not inhibit the development of tetanus is shown by the fact that when a loopful of tetanus culture was added to one, two, or three loopfuls of vaccine virus and cultures were made from these mixtures, abundant tetanus bacilli developed. Six vials were then filled with one-half Cc. of glycerinated virus, and to each was added forty-eight-hour tetanus bouillon: To No. 1, two loopfuls; to No. 2, four loopfuls; and to Nos. 3, 4, 5, and 6, respectively, six, eight, ten, and twelve loopfuls. The entire contents of each vial was then put in bouillon and incubated under hydrogen for forty-eight hours, and smears were examined. Tetanus bacilli were found in every case, thus proving that amounts of vaccine virus, considerable in relation to the tetanus, do not inhibit the development of the latter.

Six vials, each containing one-half Cc. of vaccine virus, then received successively one, two, three, four, five, and six loopfuls of tetanus culture. The mixing was thorough and cultures were made from each vial. Tetanus was found in the vial containing two loopfuls, but was missed in those containing one, three, four, and five, and again found in that containing six loopfuls. The conclusion drawn is that in as thick and syrupy an emulsion as vaccine virus there can be little certainty of demonstrating tetanus by ordinary cultural methods unless there is as large an amount of tetanus present as would be expressed by at least six loopfuls of forty-eight-hour culture to one-half Cc. of virus.

Three vials were then prepared with larger amounts of tetanus in the virus—one-tenth Cc. tetanus bouillon was added to (a) 1 Cc. of glycerinated vaccine virus; (b) 5 Cc.; (c) 10 Cc. of the same. From each of the three vials two capillary tubes were filled and the contents placed subcutaneously in two white mice, one tube in each mouse, but of the six mice only one was affected, and that one showed only a rigidity of the leg over which the injection was made. Three loopfuls were taken from each vial, planted and incubated under hydrogen; smears were then made, and no tetanus bacilli were seen. It was evident as before that small amounts tetanus infection easily elude both animal and cultural tests.

(F) To learn if tetanus germs applied with vaccine virus used as seed could be demonstrated after the interval of a week, points and pulp were collected from two calves (998 and 1018) so vaccinated; 998 were vaccinated by scarifications and by incisions, 1018 only by scarifications. The points collected from the surface of the pulp and from the bases of the curetted vesicles, the superficial pulp, and the deep pulp were all tested by cultures, and the pulp was tested also by injection in white mice. Smears made from the cultures showed typical tetanus bacilli in the points collected from the curetted scarifications of 998, and in the deep pulp collected from 1018. All the other cultures were negative, and all the mice remained well. For closer study of the same point calf 1066 received four scarifications, each a half-inch square, and on each was rubbed a mixture of tetanus bouillon and one-quarter Cc. of glycerinated vaccine virus. On No. 1 the tetanus bouillon amounted to 1 Cc., on No. 2 to one-half Cc., on No. 3 to three-tenths Cc., and on No. 4 to one-tenth

Cc. The four vaccinations took, and in six days the pulp from each was curetted, and one bone point was collected from each. Of the pulp from each as much as could be carried on the point of a tooth-pick was placed under the skin of a white mouse, and one-quarter gramme of the remainder was placed in bouillon and incubated under hydrogen for forty-eight hours. The bone point from each was also placed in bouillon and incubated under hydrogen in the same manner. There were thus made one animal test and two culture tests from each scarification. Smears were examined from the culture. None of the mice were affected, and the tetanus bacilli was demonstrated in but one of the smears, that made from the pulp collected from the first scarification which received 1 Cc. of tetanus bouillon.

(*G*) To learn if the application of tetanus germs in the manner in which vaccine is usually applied is a favorable method of developing tetanus, five white rats, which are slightly susceptible to tetanus, and also notably to vaccinia, were vaccinated by scarification with vaccine virus mixed with an equal amount of tetanus culture. All failed to show any effect of the tetanus. Five more were then vaccinated in the same way with a mixture of equal parts of vaccine virus and tetanus toxin, and as before no animal showed any tetanic infection. Four white mice were vaccinated by scarification with a culture of tetanus, and all died within forty-eight hours, and all with tetanic rigidity. Four guinea-pigs were treated in the same way: two died within three days, one in convulsions in four days, and one died in five days. Four more white rats were vaccinated with both tetanus culture and vaccine virus, and as before none were affected.

To learn the susceptibility of monkeys to tetanus, one Rhesus monkey was given a hypodermic injection in the forearm of 1/10 Cc. of forty-eight-hour tetanus culture in bouillon. In twenty-four hours the monkey could not open its mouth freely, and in less than forty hours it was dead, with the forearm and hand rigidly flexed. A second monkey was then given in similar manner an injection of 1/500 Cc. of tetanus culture. For five days there was marked and increasing rigidity of the flexed arm; after that time the condition improved, although there was some stiffness of the arm for several months. Susceptibility to tetanus having been thus demonstrated, a third Rhesus monkey was given a needle scarification about one-eighth inch in diameter on the left arm, and 1/25 Cc. of a mixture of equal parts of glycerinated vaccine virus and tetanus bacillus was rubbed in. Three days later two drops of tetanus bouillon were rubbed under the scab. The vaccination was successful, but the monkey showed no evidence of tetanus. A fourth monkey was then vaccinated by scarification with glycerinated vaccine virus, and four days later the crust was removed and 1/30 Cc. of tetanus culture was rubbed into the open wound. The vaccination was successful and no symptom of tetanus followed. A fifth monkey was scarified in nine spots, so that the epidermis was removed over a total area of about 1.7 square inches, and as much tetanus culture was rubbed in as the abrasions would take up. No symptom of tetanus followed.

The important conclusions may be summarized as follows:

1. The feces of calves fed on hay may contain tetanus germs.

2. Tetanus germs do not develop in glycerinated virus.

3. If any form of vaccine virus, either dry points or tubes of glycerinated virus, is infected with tetanus, it may convey it.

4. Small amounts of the tetanus infection easily fail of demonstration both by animal and by cultural tests.

5. If tetanus germs are applied in quantity to the inoculated areas of a calf at any time during the period of vaccine production the tetanus may be present in the vaccine virus collected.

6. Inoculation by scarification is a possible method of inducing tetanus in susceptible animals.

7. It is probable that precaution against the issue of infected vaccine virus consists less in tests of the virus than in care taken during production, and especially in the cleanliness of the methods in use in the stable and in the laboratory.

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CEREBRAL PALSY OF CHILDHOOD

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Perhaps the spinal paralysis occurring in childhood and known as acute anterior poliomyelitis, and producing paralysis of one or both lower limbs, has attracted more attention on the part of the general practitioner than those paralyses of cerebral origin. This is due to the more definite course, the shorter duration, the more exact clinical history and the want of psychical symptoms, which leaves the disease almost entirely in the hands of the general practitioner, while the cerebral cases sooner or later find their way to the specialist and usually to the public institutions.

The cerebral paralysis of childhood, however, is not so restricted either in pathology or symptomatology as those of spinal origin, and it is frequently marked by convulsive seizures, and these are often considered purely epileptic.

When the disease occurs in the newly born, it is not infrequently unrecognized for several months. It need scarcely be added that every disease producing such mental obliteration and such unhappy physical effects as cerebral palsy should be familiar to all practitioners.

According to Sachs, our very best authority on this subject, the disease has three periods of development, viz.: First, prenatal; that is, any time before the birth of the child. Second, natal, or at any time during the prolonged and difficult passage of the child's head through a narrow pelvis, where great compression, unequally distributed, is brought to bear upon the soft, bony and cerebral tissues, not infrequently resulting in a large meningeal hemorrhage. Third, post-natal, which means any time after the birth of the child, but is usually within the first decade of its life.

The fact that nearly all of these cases develop convulsions sooner or later in their history, at first unilateral, but later general, and partaking of the character of genuine epilepsy, makes the accurate observation and early treatment of this trouble of great importance.

The clinical history, especially in the early states, is frequently obscure, and may be entirely overlooked, or, if the symptoms are pronounced, it may be considered a totally different disease. Sometimes the child is taken with fever, followed by delirium, and in some cases stupor and vomiting also occur. Aphasia and convulsions may likewise mark the initial stage of severe cases. Within a short time the following unfortunate features present themselves, and are characteristic of the trouble.

First, paralysis; second, contracture of muscles; third, spasticity; fourth, idiocy, imbecility or insanity, according to the time of its development and the character of the cerebral irritation or destruction; fifth, convulsions, sometimes on one side, involving an entire lateral half of the body and later becoming general. The motor agitation may possibly be confined to one extremity. The paralysis usually manifests itself in the form of hemiplegia more or less complete, which is said to be the usual form in post-natal cases. Next in frequency occurs paraplegia, due to prenatal conditions, and, third, diplegia, or the simultaneous paralysis of each lateral half of the body. In other words, a double hemiplegia. Some authors include a monoplegia, affecting but one extremity, but this is said to be rare.

The hemiplegia may be complete or partial, involving the complete loss of motion of an entire side, including the face, though it is more usual for the face to escape serious involvement. The tongue is sometimes involved, but not seriously and not constantly.

Some of our witnesses have asserted that babies have been born not only with the paralysis, but with the contracture of the limbs, which had occurred in utero.

My own personal experience has enabled me to observe only the hemiplegic forms of this disorder, and the experience is largely confined to hemiplegia, of which we now have under observation a number of cases. If the hemiplegia occurs at birth from pressure by the natural channel, or the improper application of forceps, the paralysis may not be detected for some months, until the growing of the other side of the child's body makes it noticeable. The arm and hand are the greatest sufferers from the paralytic and contractural influences. The leg and foot usually recover much of their usefulness by persistent practice, but the arm usually remains flexed at the elbow, deeply flexed at the wrist, with the fingers either stiffly extended or flexed in irregular position, and the entire arm adducted and folded upon the chest.

The deep reflexes upon the paralyzed side are more or less exaggerated, sometimes so keenly sensitive that ankle clonus is easily produced. The reflexes upon the sound side are not disturbed. There is no paralysis of sensation on the paralyzed side and no difficulty with the sphincters. The arm may become useless and the leg may be so shortened and so stiff that locomotion is seriously impaired.

Athetoid and choreic movements frequently occur in the paralyzed extremities. Asymmetry of the face and different sides of the body occurs from the failure of development of the muscles from disuse, but there is no trophic atrophy. The body may be well nourished, and the patient do well in all other respects. Such children, however, are apt to be irritable, morose, unstable, dull, inattentive to their school duties, unteachable, capricious and wilful.

The most important symptom is the motor disturbance or convulsions, when the lesions are distinctly localized in the superior motor centers. It may manifest itself in convulsive twitchings at irregular intervals, of a hand or foot, or even a smaller segment of the motor circle. Indeed, it may appear to be a true Jacksonian epilepsy.

If the lesion is large enough or sufficiently distributed to affect the entire motor zone of one side of the body, the convulsions may occur at first and for years upon that side, but in nearly all cases with the progress of the disease the convulsions become bilateral and general, and the patient is afflicted with genuine epilepsy.

PATHOLOGY.

The pathological findings of this disorder, while diverse in different cases, are fairly frequent in the aggregate. They consist of, first, cerebral hemorrhages; second, cerebral cysts; third, cerebral sclerosis; fourth, cerebral atrophy; fifth, meningo-encephalitis, according to Strümpell; sixth, focal softening, according to Oppenheim; seventh, porencephaly or defective formation of the brain; eighth, hydrocephalus, and, ninth, according to Sachs, a well-defined agenesis of the cortex, or a failure of cortical development. These lesions are usually found upon the surface of the brain, but some have been known to develop in the basal ganglia. Their location and extent determine the character of the motor disturbance and paralysis. It has been definitely stated that large effusions of blood have been found over the cerebral cortex in newly-born infants, due to the prolonged pressure and blood stasis and tearing of the sinus veins. If the patient survives, this clot will be more or less organized into a dense membrane and the original character of the lesion overlooked.

The most important effect of this pathological condition is upon the development of the mental faculties. Such children are either idiots, imbeciles or dements.

ETIOLOGY

In addition to prolonged confinement and personal shocks to the pregnant mother, infectious diseases of childhood, measles, scarlet fever, diphtheria, pneumonia, smallpox and typhoid fever have been strong factors. Injuries to the child after birth are also causative. Syphilitic infection or heredity plays some part. Oppenheim considers premature birth an important factor. Acute inflammation of the brain and its membranes from infections are causative, and likewise embolism and thrombosis of cerebral blood vessels from the same causes are important.

It is claimed that the improper use of forceps has also a positive causative effect, but, on the contrary, it is believed that the proper application of the forceps in tedious and difficult labor will have a preventive effect.

DIAGNOSIS

Most of these patients present more or less definite clinical features, and the disease cannot be overlooked by a cautious observer, but it may be masked by convulsions and consequently be pronounced epilepsy upon this superficial study, and continue under that classification. It should be said in this connection that cerebral bony anomalies and asymmetry form suspicious circumstances.

Markedly microcephalic or plagiocephalic skulls have an indicative bearing. The definitive presence of paralysis, with the rigid condition of the muscles and increased tendon reflexes with convulsions, makes the diagnosis almost certain. The convulsions, as before stated, may be limited to one side, and there is no involvement of sensation, and the ultimate fixation of the limb in contracted position makes it certain. It must be differentiated from epilepsy, and from acute spinal paralysis, which affects one or both extremities, and is degenerative in character, with lost reflexes and occurring suddenly with high fever, vomiting, stupor, and immediately following paralysis. There are no later convulsions, and no cerebral symptoms in the latter disease.

TREATMENT

After they reach our asylums, little remains to be done, except to take care of the general health and treat any symptoms arising. Prior to this time, it may be surgical, to remove an early lesion of definite location and certain effect. Medical, to build up the child, prevent the development of convulsions, save him from the stress and strain of life, and, above all, not to attempt to educate him as a normal child. Preventive treatment is rarely considered, and yet, when it is remembered that so many of these cases are due to dystocia, according to Joseph Collins, it is incumbent upon every obstetrician to use every scientific means to lessen prolonged and dangerous deliveries. The forceps should be used before pressure has been productive of the lesion. After birth, people should be thoroughly educated to avoid all the infections of childhood instead of courting them, as seems to be done even yet among the less educated classes. It should also be stated that every infectious or contagious disease should be treated with more care and foresight, to prevent complications.

In the acute form of the disease, rest in bed, ice-bag at the head, free purgation, light diet and bromides to produce quiet.

Later, if convulsions appear and a definite lesion can be found, remove it. If not, treat expectantly. For wasting or undeveloped muscles, use friction, warm baths and massage. If contracture is very great the tendons should be cut, and such orthopedic appliances used as will effect the highest degree of locomotion. After genuine epilepsy has developed, nothing is effective.

In conclusion, I desire to present you the following illustrative cases:

First. *Post-Natal, Left Hemiplegia.*—W. E., aged 20 years, parents healthy; father railroad man. Heredity good, except one paternal uncle epileptic. In childhood had measles, mumps and whooping-cough. There was no difficulty at the time of his birth. His mother was in labor six hours, and was normally delivered. She had not had any fall, injury, shock or fright of serious character, and neither had the child up to the development of an attack of illness which produced the present condition. At eight years of age he had a severe attack of typhoid fever, which lasted six weeks. At the end of the third or beginning of the fourth week he became unconscious suddenly, and developed paralysis, involving the entire left side. He could not move either arm or leg, but after his recovery from unconsciousness he could feel on that side, though sensation was weak. He had fever at the time the paralysis occurred, but was not delirious. It was thought he would die, but slowly he emerged from the difficulty. Within two or three months after the paralysis occurred, the hand and leg of the affected side began to draw up. Up to this time he had never had any fits or convulsions, and had manifested no weakness of mind. His recovery from the typhoid fever was slow, and he remained dull afterwards, frequently with pains in his head, which would last for twelve hours, and occur once or twice per week, when he would have no appetite, become irritable and depressed. He continued in this condition until three or four years ago, when he began to show slight evidences of mental disturbance; he became irritable, morose, unruly, with capricious appetite, irregular bowels, headache and unusual conduct, such as crawling under the bed upon getting miffed at any little thing. This condition gradually increased until it became necessary to admit him into the institution, January 13, 1902. He had not up to this time, and has not since, so far as we know, developed any convulsions. He was placed upon systemic treatment, kept quiet, dieted, regulated, given a tonic with an occasional sedative, and has continuously improved in physical condition, and his mental irritability appears now to be as well as it can ever be expected to become. Upon inspection at present it is seen that his head is not entirely symmetrical, but not markedly otherwise. Vision is apparently normal. Slight pterygium on each eye, hearing normal, rather high arched palate and a few bad teeth, but nothing special. Eye and tongue movement normal. Slight asymmetry of chin and left side of face. He presents a very marked case of left hemiplegia, with contracture of the muscles. There is very little difference in size in the muscular development of the two sides, from three-eights to three-fourths of an inch. He has slight athetoid movements in the left hand. The flexors of his hand and arm are considerably contractured, as also those of the leg, interfering seriously with his gait, producing a pes equinus. The patellar reflex upon the afflicted side is much exaggerated; the other side is normal. Sensation in paralyzed side is normal. The superficial reflexes are also normal. The electrical response to a secondary Faradic current is quite normal upon the entire left side. He is, therefore, a typical case of cerebral palsy, occurring at the age of eight years, and following an attack of typhoid fever, probably directly produced by a cerebral hemorrhage over the right motor cortex. He illustrates the classic features, with the single exception of convulsions, which he has never yet developed, but which may occur in the course of the disease. He has the typical paralysis, spasticity and contracture of the muscles, with normal electrical response, and with the mental enfeeblement characteristic of the disease.

Second. *Natal, Right Hemiplegia*—E. R., aged 19 years. Father healthy; mother subject to nervous headache and indigestion. Maternal uncle suffered for years with nervous disease, at times unbalancing his mind temporarily. His maternal great-aunt during childhood was subject to blind flashes, eventually going blind, and dying at the age of eighteen.

His mother did not have any fall, injury, shock or disease prior to his birth that would affect him. At birth no instruments were used, though it seems they were contemplated and kept in readiness, for the labor was very long and extremely difficult, and the mother had severe convulsions before his birth, and medicine had to be administered for that purpose.

Immediately after birth it was noticed that he fretted and cried all the time, practically, till three months of age. After birth, so far as known, he never had any severe shock, injury or fright, and none of the ordinary diseases of childhood have been reported. The first thing wrong observed about the child, as before stated, was his continual fretting and crying till about three months of age, when it was observed that he was paralyzed upon the right side, and that he took everything in his left hand, keeping his right hand closed. Later, when he attempted to crawl and walk, he did not seem to have good use of his right leg and foot.

His mental condition did not show any deviation from that of a growing child up till twenty months of age, when he began to have convulsions. They were light at first, and occurred upon the left side, as the history shows he was drawn to that side. This is presumably due to the paralytic condition of the right side. In about one year he had another short period of convulsions, and then they came at intervals of several months, and then they became of almost daily occurrence. He had the usual epileptic symptoms, but remained a comparatively bright child until seven or eight years of age. He was sent to school for a short time, and learned quite well, but was forced to leave school on account of the hard convulsions. These convulsions continued, becoming more frequent, and his mental condition constantly deteriorating until he finally became turbulent and unruly, suffering from severe convulsions, attacking people about him, his speech becoming more and more difficult, and his memory rapidly failing, until it became necessary to admit him to the institution three years ago. Since which time he has progressively become demented, and his convulsions have continued.

He has just recovered from an attack of pneumonia, followed by a suppurative otitis media in his left ear, which is still quite bad. A slight inspection shows that his head is large enough, but asymmetrical. He is paralyzed upon the right side, and has suffered from failure of muscular development along the entire right side. Measurements around the right biceps on left side show 8¾ inches, right side 7 inches. Left wrist 6 inches, right wrist 5 inches. Around middle of left thigh 14¾ inches, right thigh 12¾ inches. Left calf 11⅜ inches, right calf 10 inches. Patellar reflexes on both sides are exaggerated, but markedly so on the paralyzed side. Sensation is normal on the paralyzed side, and his sphincters are under control. His superficial reflexes are not quite sensitive, but I think this is perhaps due to his demented condition. His right hand is flexed at the wrist; fingers usually contracted, but no marked contracture, as they can be extended.

From the history of this case and his present appearance, I think we are safe in concluding that this is a natal case of cerebral palsy, occurring at birth, from the long-continued pressure upon the child's head. Paralysis first occurred, and it was nearly two years before convulsions supervened. He has pursued a perfectly typical course, and has been all the time beyond the hope of medicine and surgery. His mind is almost extinct, and it is only a question of a short time, with his greatly reduced vitality, till an epileptic convulsion will terminate his life.

HARE-LIP AND ITS TREATMENT

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The malformation known as hare-lip results from failure of union between the lateral portions of the upper lip and the median portion which lies over the intermaxillary bone. If this failure occurs on one side only it results in a single hare-lip, if on both sides in a double hare-lip. The fissure may be a slight notch or it may extend clear into the nostril. Whatever its extent it is always edged about with more or less of the "vermillion border" of the lip. Where the fissure in the lip is extensive there is usually a cleft of the palate. If the hare-lip is double and complete there may be a wide cleft through which the nasal septum can be seen.

I do not propose to consider cleft palate except as it bears directly on the operative treatment of hare-lip. Therefore, I shall omit any discussion as to the merits of operations for cleft palate and the age best suited for them.

Cleft palate is the result of failure of union of the suture between the intermaxillary and maxillary bones on one or both sides. In complete cleft palate the intermaxillary bone projects directly forward as a continuation of the nasal septum. In unilateral cleft palate it is attached on one side to the maxillary bone and so projects diagonally forward. In either case, projecting considerably further forward than it normally should, it reaches far anterior to the lower jaw.

The first step in operating upon a hare-lip, whether single or double, is to correct the bony deformity if it exists. Where there is a complete cleft palate this correction is easily made by grasping the septum through the cleft in the palate and fracturing it with a pair of bone forceps with their edges wrapped in gauze. This is preferable to cutting out a "V"-shaped piece, as there is less hemorrhage and no necessity for suturing. The fractured septum bends easily and the projecting intermaxillary can usually be pushed back. Where the cleft in the palate is unilateral and slight, the septum cannot be reached from below, and in babies it cannot be reached through the small nostrils. Therefore, fracture of the maxillary-intermaxillary suture on the sound side is accomplished with padded bone forceps and the bone pushed forcibly into place, using the line of fracture as a hinge. Sometimes it is necessary to partially cut the anterior portion of the intermaxillary from the septum, from below upward, and bend the projecting part downwards and backwards.

Having corrected the bony deformity, the next step is to make the lateral portions of the lip and cheeks freely moveable, so that the two sides may come together without tension. This is done by making a small incision at the junction of the lip and the gum on each side at the point corresponding to the canine fossa. Into this incision put a blunt-pointed pair of scissors and free the cheek almost to the lower border of the orbit. A small strip of gauze on each side will stop the hemorrhage.

I prefer to have the child held in a nurse's arms with the head well forward. The anesthetist stands at the left side and the anesthetic is given lightly, choosing times when hemorrhage is completely controlled. The assistant stands behind the nurse and with a forefinger in each corner of the mouth he can compress the coronary arteries with his thumbs, without having his hands and arms in the operator's way. If the hare-lip is single, I pierce the lip from within outwards with a thin knife at the apex of the fissure; or the edge of the nostril, if the fissure enters that aperture, and carry the knife with a sawing motion downwards and a little outwards to a point where the lip is fairly normal in direction. The upper part of the incision is made where skin and vermillion border unite, and the lower part is gradually widened to about one-eighth of an inch from the vermillion border. The other side of the cleft is treated in the same way. If the two sides with the cut flaps turned down do not bring the general level of the lip low enough, I make a short cut at right angles to the first cut in one or both lips, as may be necessary to make them of equal length.

In choosing where to make these cuts, the object is to damage the blood-supply of the line of suture as little as possible. Having fitted the two sides of the lips together, I next put two or three stitches in the mucous membrane to be tied from within the mouth. These stitches should not be tied until later. They should include very little besides the mucous membrane, which it is their object to closely approximate, thus preventing saliva, etc., from entering the line of suture. The best material for these sutures is silk, which has been soaked in compound tincture of benzoin, as it will not untie even in a nursing child. Having placed the inside sutures, a "principal" suture of silkworm gut or horsehair is placed in the middle of the lip, including skin and muscle but not mucous membrane. It should enter at least half an inch from the edge of the wound on each side. Additional sutures needed to approximate the edges of the skin can be more shallow. The sutures should none of them be tied too tightly, care being taken to see that the lip is not blanched. I no longer use tension sutures or any dressing to draw the cheeks together on single hare-lip, and I have not done so on several cases of double hare-lip, relying on complete freeing of the cheeks and careful apposition. If it is thought best to use some appliance to prevent tension, a mattress suture from cheek to cheek may be employed, it being tied over a small roll of gauze at one end with a similar piece under the loop at the other; or, instead of a suture, a dumbell-shaped piece of *crêpe lisse* or gauze may be fastened to the cheeks with collodion, its isthmus passing across the lip; or a similar dressing of adhesive plaster may be used. I use no dressing, simply dusting the lip with aristol. If the nostril is compressed, I sometimes put a small piece of rubber tube into it as a nasal splint. After the operation much indigestion will be avoided if the stomach is washed to remove the blood, more or less of which is always found.

In double hare-lip, after correcting the bony deformity, and freeing the cheeks, I pare away the vermillion border of the middle portion of the lip, taking care not to separate the skin from the underlying intermaxillary bone, which makes an invaluable splint. I then cut the lateral flaps much as in simple hare-lip, except that the base is made somewhat wider. After cutting, however, the disposition of the flaps is not the same, the fixed portions of the lips being attached to the sides of the central square and the turned-down portion being made to meet beneath it. These turned-down portions must have good blood supply, and it is to insure this that their bases are left broader than in single hare-lip operations.

Sutures are placed in the mucous membrane to be tied after the principle sutures, then a "principal" suture starting half an inch from the side of one lateral incision including all but mucous membrane passing through the central body and out half an inch from the edge of the opposite lateral incision. This suture must not be tied too tight. Superficial sutures are placed wherever needed, and the wound dusted with aristol. If thought best, the methods of relieving tension above described may be employed, but I have successfully done without any support in bad double hare-lips and am pleased with the cleanliness of the method without dressing of any kind. If tension sutures through the nose are used, they should be removed in about forty-eight hours, to avoid the bad effects of suppuration.

Feeding after hare-lip operations depends on the child's general condition. If it does well on feeding from a medicine-dropper or spoon, it can be advantageously fed in this way, either with its mother's milk or other feedings. If it does badly, it can often be put to nursing or to the bottle immediately after recovery from ether. In case of double hare-lip, immediate nursing is to be avoided whenever possible, as the result is always somewhat injured.

The important points in hare-lip operations are the following:

1. Cleanse the nostrils carefully with boric acid and sterile water, also the lips and mouth.
2. Etherize the child but lightly so that the coughing-reflex will prevent inhalation of blood.
3. Free the lips and cheeks thoroughly so as to take all tension from the intended line of sutures.
4. Control the coronary arteries with the fingers.
5. Cut flaps.
6. Put stitches in the mucous membrane, to be tied later.
7. Put "principal" suture well back from the edges of the wound and do not tie it too tightly.
8. Approximate the edges carefully with superficial sutures.
9. Wash blood from the stomach.
10. Dry the wound and dust it with aristol.

SPEECH DEFECTS IN RELATION TO MENTALLY DEFICIENT CHILDREN*

By Henry Ashby, M.D., F.R.C.P.,

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Anyone who has had much to do with examining or teaching mentally defective children, cannot fail to have noticed what a large percentage of such children articulate badly or have some marked defects of speech. It has been estimated that in some German schools 14.4 per cent. of the mentally deficient have defective speech, .16 are aphasic, .18 totally deaf, and 3 per cent. partially deaf. When examining some 500 dull or mentally feeble children in Manchester several years ago with Miss Dendy, we found that 19 per cent. of these had well-marked defects in speech, while another 7.8 per cent. had minor defects.

In a recent report, Dr. Kerr, in referring to the mentally defective children in the special schools of the London School Board, says: "The majority of these children present speech defects in such a degree that it is almost useless to attempt reading until a fair articulation is obtained."

In connection with these statistics it is clear that the more low grade mentally deficient children we include in our examination, the greater will be the proportion of those with serious speech defects.

A. MacLeod** tested the articulation of 10,000 normal children in sixteen schools, including the poorest, as well as the lower middle-class schools. He found that 2.94 per cent. had some form of impediment in their speech; of these 1,82 per cent. were stammerers; 1.12 were otherwise imperfect in articulation, "as evidenced by the number of defective articulations." Among 4,960 children, the failures with *R*, were 43; with *S*, 41; with *L*, 30; and with the remaining consonants 39.

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*Being a paper read at the Liverpool meeting of the Royal Institute of Public Health.

**Quoted by Dr. J. B. Hellier.

It is tolerably certain that the speech defects found in the normal schools were comparatively slight, and it is needless to say that neither stammering or failure to pronounce aright an *R* or an *S* is evidence of mental defect; but assuming there is no defect of hearing, failure to speak or marked slurring or baby language in a child of 5 or 6 years of age is almost always associated with subnormal intelligence. It is unnecessary to emphasize the fact that any marked articulation defect still further handicaps a slow or deficient child and renders its future still more dark. Mothers of such children will often say that it is the speech impediment that troubles the child the most, that it could be sent on an errand to a shop, if it were not that it could not make itself understood by strangers.

In considering the causes of speech defects let us at first consider how far these causes are the result of disease or maldevelopments, which give rise to an abnormal condition of the cavities of the nose, pharynx or mouth. In other words, how far are speech defects produced by imperfections in the actual instruments used in articulating. Then later we will consider the far more important question of anomalies of the nerve centres in connection with the organ of speech. The cavities of the nose and pharynx may be considered together, inasmuch as in the large majority of instances, when one is at fault the other is also. By far the commonest naso-pharyngeal anomaly which gives rise to defective speech, is an obstruction between the pharynx and nasal cavity from the presence of chronic catarrh, or in the worst cases by hypertrophy of the adenoid tissue, known commonly as "adenoids." The nasal obstruction, if considerable, interferes with the escape of air through the nose in articulating *M, N* and *Ng*, consequently morning becomes "bordig," and mamma "baba." With regard to the cavity of the mouth, the most important is a deficient or "cleft" palate, this deficiency allowing of the escape of air into the nasal cavity during the articulation of *P, B, D,* etc., giving the speaker an indistinct utterance and nasal twang to his voice. Even after the anomaly has been remedied by operation, the child often has for years a nasal twang in speaking and requires a considerable amount of training to speak aright. Among other mouth anomalies we have those of the tongue; there may be "tongue-tie," large tongues, long tongues, thick tongues, which have been supposed to interfere with articulation by producing a thickness of speech or other defects.

In certain classes of imbeciles, such as Mongols, and in cretins, the tongue is disproportionately large for the mouth, and such children are late in talking, but it may be doubted if the large tongue has much to do with it. Some observers have attributed considerable importance to these anomalies in the shape and size of the tongue in producing thick or slurring speech much more than I am inclined to; it is rather the nerve centres which coordinate the movement of the tongue that are really in fault.

Parents are apt to attach much importance to an adherent or tied tongue, as an important factor in producing lateness or defective speech. How prevalent this idea was until recent times is illustrated by the fact related by Gutzmann, that in some districts in Germany, the midwife thought she had not done her duty to her charge, if she did not at birth cut the infant's tongue for fear it might grow dumb! If a child can protrude its tongue so that the tip passes over the lower lip, or can pronounce words beginning with *L,* as *la-la-la*. its tongue is free enough for speech.

Defective speech is in some cases attributed to high V-shaped palates. High palates are very frequently noted among mentally feeble children, and in many instances are associated with more or less nasal obstruction, the posterior openings of the nasal cavity being narrow or more or less blocked by adenoid overgrowth. In such cases there will probably be more or less "stuffy" speech and a failure to articulate the nasal resonants. There are, however, some few cases in which the presence of a high palate is associated with speech suggesting a cleft palate, the speech being indistinct and of a nasal twang. Bearing in mind the difficulty a child who has been successfully operated on for cleft palate has in acquiring normal speech, it is perhaps not surprising to find that children who have a V-shaped palate, the result of defective development, may have a similar trouble. Possibly in such cases the soft palate acts imperfectly in shutting off the cavity of the pharynx from the nasal cavity; but it more likely to be an imperfect innervation than a physical defect.

In any case of defective speech it is of importance to carefully examine the nasal, pharyngeal, and mouth cavities for abnormalities, even though they play a far less important part in producing defective speech than is popularly supposed. Parents are much more anxious to explain the impediment in the speech, or the failure to talk at the usual time, to oral deformities than to mental backwardness or mental deficiencies. In examining a child who fails to talk, say at three years or over, the two most important questions to be answered are:

1. Is the child deaf?
2. What is his mental status as compared with the normal child of the same age?

Oral deformities are hardly likely to explain a failure to talk, though the question of long-continued ill health, or some recent illness, will have to be considered.

The detection of deaf-mutism in a young child is not always easy, and mistakes may easily be made even by an expert, and parents are constantly deceived. Deaf mutes may, of course, hear a clock strike, or loud noises, such as street bands, and take a grusome delight in grinding a barrel organ, but yet be unable to distinguish words. As the child becomes older and more intelligent the difficulty becomes much less; the use the child makes of its eyes, its intelligent ways, its quick interpretation of gesture, while it pays no attention to what is said to it when it cannot see the speaker's lips, will enable the observer to decide that its mutism is due to a congenital defect of hearing.

Some feeble-minded or abnormal children will obstinately refuse to answer questions, though it is clear they hear the sound of a whistle or the voice, and afterwards it is certain from something they do or say that they have heard what has been said. In other abnormal children their attention is so riveted or taken up with some toy or new object that they will take no notice of loud whistling or clapping of hands.

Not long ago I saw a little Hebrew boy of six years, whose parents couldn't speak English, and who was supposed to be deaf. His vocabulary was very limited, and the sounds he made were unintelligible. Certainly he gave to a superficial observer the impression he was deaf. He ran about the schoolroom catching hold and playing with a ball of wool, a slate and pencil, or anything he could lay his hands on, entirely oblivious to "cat calls," whistles and shouts. These all failed to arrest his attention. Suddenly some one dropped some pennies on the floor behind him; he heard the rattling coins, turned around and was after them in an instant. It is difficult to get the attention of such children and to distinguish with certainty he difference beween "Taubstummheit" and "Hörstummheit."

Cases of the so-called "congenital aphasia" are not altogether rare. A child, let us say of six years or more, doesn't talk, or his words are unintelligle to a stranger, or perhaps some of his words are of his own invention. He is not deaf and he passes muster among his friends as an intelligent child. He certainly hears much of what is said to him; he will fetch his father's slippers at night, will point out things he wants, or push his plate close up to the joint at dinner when he wants some more. It is tolerably safe to say that such children are rarely of normal intellect; though apparently bright and active, they exhibit an abnormal want of control, are unable to fix their attention for long together, they are babyish in their ways and usually are terribly "spoilt." They will rummage in your drawers, spread out their contents on the floor, spill your ink and tear up your papers; all of which proceedings the mother watches with great unconcern, or adduces them as evidence of cleverness, and expresses a very decided opinion that the child would talk fast enough if his tongue was cut.

In other cases the mental feebleness which is associated with failure to talk is less obvious, but it must be rarely entirely absent. But the chief defects most likely to be met with among the mentally deficient children in our special schools are articulation defects rather than a failure to speak. These defects vary from the mispronunciation of a few consonants to an almost unintelligible mumble. There may be thickness of speech more or less marked, a slurring over syllables or words, "scamping"—that is dropping syllables or words or a transposing of consonants, easy ones being used in place of the more difficult ones. The term "lalling" is sometimes used to include all the above defects. Hesitation in getting out words or stammering is common.

While marked lalling in a child of six years or more is nearly always associated with some subnormal intellectual power, it is needless to say mental feebleness may be present without any "lalling" or other speech defects. The degree of lalling present does not correspond with the degrees of mental feebleness. Imbecile children will often "echo," that is, repeat the last word of a question, the pronunciation being perfect, but without the least idea of the purport of the question put. On the other hand, in children intelligent enough to understand simple questions and know what they intend to say, their speech is almost unintelligible through articulation faults.

The infant can understand a good deal of what is said to it some months before it can use words to express its ideas. The road *in* through the ear is a much straighter and easier highway than the road *out* through the organs of speech. The infant gradually learns by means of sight, touch, taste, etc., to associate the word heard with objects or actions, then some time elapses before he uses his vocal organs for the production of names in their proper sense. There is a period of "physiological dumbness" which varies considerably in children of normal intellects. The word-perception center has stored up many associations in conjunction with the other perception centres, and the child capable of expressing himself by gesture, that is, by the movement of face, head or arm, before the road out *via* the motor-vocal center is opened up.

How much more complicated is the series of muscular movements which take place in voicing the word "yes," than in nodding the head to express assent! In the former case a group of muscles are thrown into contraction or relaxation in order to cause a rush of air through the larynx; another set operate the vocal cords and movements of the larynx; while the tongue is moved and the cavity of the mouth and pharynx moulded to produce the *y, e, s* sounds. No wonder if a child is asked if he will have a piece of cake, he nods his head or puts out his hand, and if he say "yes" he forgets to say "please"!

The mentally defective child who cannot distinguish between red and yellow, or has a difficulty in buttoning his trousers or waistcoat, is only too likely to lack the intelligence and skill to use his lips and tongue with the precision necessary for the performance of articulation speech.

In some cases of defective speech where the intelligence is fairly normal or only slightly subnormal, the chief defect may lie in the motor-vocal-center, but in the majority of cases the child lacks the one thing necessary for action, that is the power of concentrating his attention, and he has no clear idea of the movement or the result of the movement of his vocal organs. The normal child during his first attempts mispronounces letters and words, but as time goes on becomes aware of his mistakes and makes efforts to avoid them. He consciously and unconsciously imitates those around him. The child lacking in intelligence is clumsy in his muscular movements, is not wholly conscious of his mistakes, and makes no effort to learn better.

Mentally deficient children are mostly late in learning to both walk and talk: probably there is a late development of motor centers, as well as the higher intellectual centers. They often are clumsy in other movements, as in swallowing. It is curious to note that there is a type of mentally deficient child, who, though he can articulate fairly well, is shy and retiring, and cannot be got to talk, at any rate, to a stranger; there is another class who are just the opposite, and when they make a start in talking there is no stop to their chattering. The former class are exceedingly difficult to examine; they are frightened at being touched, and take refuge in tears. With this latter class there is endless activity of the limbs and body, and show a complete want of self-consciousness and self-ccontrol. We see in these cases an exaggeration of the different temperaments found in normal children.

In the first line of treatment comes the careful testing of the child's powers of hearing, an examination of the cavities of the mouth, nose and throat, and an estimation as far as possible of the child's intellectual powers. Then the nature of the child's defective articulation may be tested by means of the physiological alphabet using the names of common objects which are familiar to the child (the Education Committee of the Manchester City Council have printed the physiological alphabet in chart form and words illustrating the alphabet), thus such words as *papa*, *pat*, *baba*, *bât*, *mama*, *mat*, etc., are used for testing the child's articulation of the consonants in the first stop position. We shall soon find out that *Th* is one of the stumbling blocks, *three* becomes *free* and *Ruth* becomes *roof*. *R* is another that frequently goes wrong; *run* becomes *wun* and *try* becomes *twy*. It is needless to say that defective R's are not confined to the schoolroom, and possibly we may have heard that "Barwabas was a wobber" in other places than special schools*

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*For an account of the "defective articulation of the consonant R," see article by Dr. J. B. Hellier, *Edinburgh Medical Journal*, July, 1898.

It would be tedious here to go into details and to point out how *S* and *L, K* and *G,* and less often *F* are "scamped" or transposed alike in the language of children learning to talk, and in the language of backward and mentally feeble children. But after all scamping and transposing consonants form only a part of the speech failures. A thick, indistinct utterance is very common, an altogether unintelligible attempt at many words is often present. Whispering is not uncommon, the child making no effort to raise his voice and perhaps speaking but seldom. In rarer instances unmeaning and useless syllables are added at the ends of words.

There is no time, I fear, for going into the question of treatment with any detail. Breathing exercises are, I believe, of much value when taken in conjunction with other physical exercises. Every medical man knows what poor control most children have over the muscles of respiration. A child is asked to take a deep breath; he either makes no attempt or draws in the abdomen and shrugs the shoulders while he holds his breath! Such exercises should include taking deep breaths, shallow breaths, quick expirations, slow expirations, etc., in order to get as much control as possible over the muscles of respiration. Singing or vocal exercises of the larynx are likely to be useful.

With regard to speech defects, the faults must be found out by the physiological method already referred to, and daily exercises given to overcome the difficulty. The teaching being by the oral method, the child is made as far as possible to understand his mistakes and the way to correct them. Much will naturally depend upon the child's intelligence and perseverance, but that much can be done, experience has already proved.

THE FATALITY OF WHOOPING-COUGH

By Eliza H. Root, M.D., of Chicago, Ill.

It is too generally conceded by the people that whooping-cough is a simple affair. Unfortunately the medical profession share in the popular idea of the insignificance of the disease. People have been foolish enough to court the contagion by wilfully exposing their children, with the assertion, "better have it now and be done with it" or "have it now and it will not be so hard. The later idea is usually based upon the season of the year or upon the mildness of the epidemic prevailing at the time.

Whooping-cough is a serious disease and exposure to it should be avoided as much as possible. It not only causes death, but often leaves serious physical, mental or nervous defects that remain with the victim for the remainder of life. While the termination of the disease, when no complications occur, is usually complete recovery, death often results.

Some writers claim that death from complications during an attack is not common. While others lay more stress upon the danger to life from complications. A study of the vital statistics issued by city health departments will lead the student to consider whooping-cough as grave a disease as scarlet fever.

In the city of Chicago during the first six months of 1903 there were 150 deaths from whooping-cough, which was more than one-half as many as from scarlet fever for the same time. For the first week of August, 1903, according to the Bulletin of Chicago's Health Department, there were five deaths from whooping-cough with but one from scarlet fever, while the corresponding week of 1902 reports twelve deaths from whooping-cough and ten from scarlet fever.

The State of Michigan reports for June, 1903, twenty-eight deaths from whooping-cough as against ten from scarlet fever.

Reports from Paris, France, show nearly the same proportion of fatalities. In the twentieth week five died from whooping-cough and five from scarlet fever. In the twenty-fourth week ten died from whooping-cough and four from scarlet fever.

In Scotland, the deaths registered in eight principal towns for the week ended May 16th, 1903, give four from scarlet fever and twenty-five from whooping-cough.

From the United States census of 1900, we find that 663 died in New York from whooping-cough and 549 from scarlet fever. In Chicago, 141 died from whooping-cough and 373 from scarlet fever; Philadelphia, 179 from whooping-cough, 182 from scarlet fever; St. Louis, 33 from whooping-cough and 47 from scarlet fever; Boston, 93 from whooping-cough, 163 from scarlet fever; Baltimore, 22 from whooping-cough and 18 from scarlet fever; Cleveland, Ohio, 31 deaths from whooping-cough and 34 from scarlet fever; Pittsburg, 72 from whooping-cough and 45 from scarlet fever; Buffalo, N. Y., had 32 deaths from whooping-cough and 26 from scarlet fever.

Death from whooping-cough occurs most frequently from pneumonia as a complication that induces heart failure, or a bronchitis may occur that ends in suffocation. Asphyxia or marasmus, due to the continued ejecting of the food or loss of appetite may cause death. Cerebral apoplexy, external hemorrhage and emphysema of the subcutaneous tissues after rupture of the larynx is occasionally given as the cause of death.

Rosen von Rosenstein, of Sweden, and Lombard, Geneva, Switzerland, have observed fatal secondary dropsy in isolated epidemics.

It is quite apparent that whooping-cough, a disease little dreaded by the laity and considered lightly by the profession, is as much to be dreaded because of its fatality as scarlet fever. Scarlet fever is greatly dreaded because of its after effects. It may cause more of these unfortunate after effects than whooping-cough does, but the latter causes enough serious after effects to make it a disease to be avoided. While the termination of a case of whooping-cough may not be death, it may be a partial recovery only. Such cases are not infrequent. Severe disturbances of the nervous system remain, as weakness of the intellect and memory; imbecility, hemiplegia with following chorea, epilepsy, etc. Visual defects, strabismus, blindness and deafness, partial or com plete and even deaf muteism may remain. Whooping-cough, it is evident, should be under the control of the authorities, subject to quarantine and other preventive measures as much as scarlet fever. Methods varying only in their adaptability to the two diseases.

Scarlet fever is not only contagious, but it is highly infectious. It can be conveyed from a scarlet fever patient to another individual by one not ill of the disease. It is "carried" about the neighborhood by careless members of the exposed family, by milk, dogs, cats, etc., and requires strict measures to prevent its spread.

Whooping-cough, so far as known, is not so "carried," but it is actively contagious from one person to another. Its control need not be as complicated and far reaching as that of scarlet fever. But the number of deaths from whooping-cough and the serious after effects make it imperative that whooping-cough cases should be isolated and controlled by the local health authorities. To make it a returnable disease would aid in gathering statistics that would furnish us with a knowledge of the number of deaths occurring in the number of cases reported ill of the disease, and the only way to know its true fatality as compared with scarlet fever, and the only way in which to lower the death rate, entirely too high from its ravages.

REPORT OF A CASE OF FAVUS OF SCROTUM, CO-EXISTING WITH RINGWORM OF THE THIGH, GIVING IDENTICAL TRICHOPHYTON-LIKE CULTURES[1]

By A. D. Mewborn, M.D., of New York.

FROM PEDIATRICS LABORATORY, N. Y.

In 1896, Bodin[1] gave a very interesting description of two cases of ringworm in calves which, clinically and microscopically, were due to a large-spored trichophyton (endo-ectothrix), but which (in cultures on glucose-agar), instead of the downy-like, crateriform or button-form of the trichophyta, gave an irregular, elevated, greyish, humid or cerebrium growth.

These cultures grew best at a temperature of 30 to 33 degrees C., in media rich in peptones (5 per cent.) but poor in hydrocarbons. They rapidly liquefied gelatine, and did not produce spores in grape form (Botrytis). All of these characteristics would undoubtedly fix it in the anchorion or favus group. Bodin called the disease *"favus à lésions trichophytoïdes."*

Sabouraud[2] observed the same facts in man and animal (especially the calf), and described the lesions as "vesicular or pustular circles, sometimes a veritable *kerion Celsi,* with intense follicular suppuration." In all of these cases the microscopical examination showed a "mycelium with spores in chains," and a culture of slow growth, humid and cerebriform. Sabouraud was inclined at first to agree with Bodin that it was "favus à lésions trichophytoïdes," but at present he maintains the opinion that it is a special class of trichophyta with *faviform cultures.* In fact, the higher or perfect form of all these *Hyphomycetes* (Microsporon, Trichophyton, and Achorion) has not yet been found, hence it is impossible to definitely classify them.

Much light has been thrown on the question of classification by Bodin[3] in his communications on the *"Microsporum du cheval,"* and especially on its pleomorphism. He describes three distinct forms of growth, under different conditions of temperature and aëration, which he obtained from ringworm of the horse,

1. *Endoconidium.*—This was obtained by cultures direct from the animal, and gave on beer-wort agar a reddish yellow, glabrous, plicated colony. When this culture was inoculated under the skin of a horse it produced a typical ringworm.

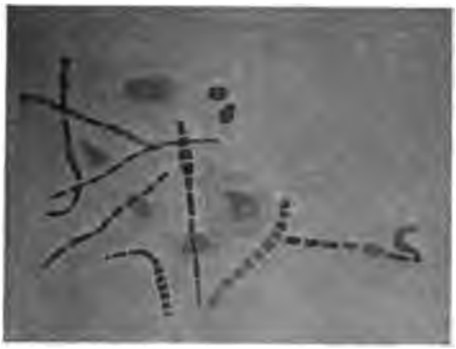

Fig. 1.

2. *Acladium.*—This was obtained by keeping the endoconidium cultures at a constant temperature of 33 degrees C. on a medium rich in nitrogenous material. In a few weeks a thick, silky down spread over the entire growth. This form has the peculiarity of remaining fixed in type after repeated transfers to different media, and must be inoculated into an animal to bring it back to the endoconidial form. When so inoculated it produced a typical ringworm.

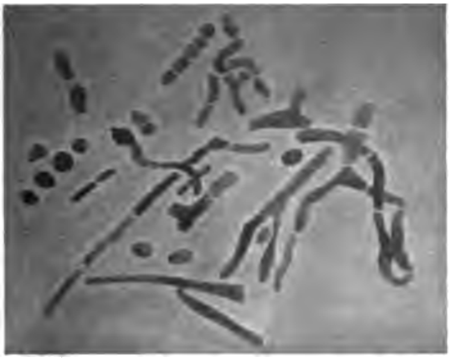

Fig. 2.

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[1] Illustrations by courtesy of Journal of Cutaneous Diseases.

obtained a downy white trichophyton growth. Finally, Sabouraud[6] describes a typical case of favus in a mouse, with numerous favus cups, which gave in direct cultures a heavy, downy, trichophyton growth.

Sifting down all these facts, we must admit with Sabouraud that favus cannot be characterized clinically as a disease invariably associated with a crust formation in the shape of favus cup, since there are favus cases without cups, but characterized by a pityriasic, impetiginous aspect, with well marked folliculitis (Besnier, Brocq). Neither can the description of the culture as *"spongeoid"* be considered as typical, since favus cultivated hereditarily from pleomorphic variations loses this spongeoid form and takes on the downy form. Even the spore formation in grapes cannot be considered distinctive, since the *"pectinated"* forms, described by Sabouraud, can be considered as modifications of the grape form.

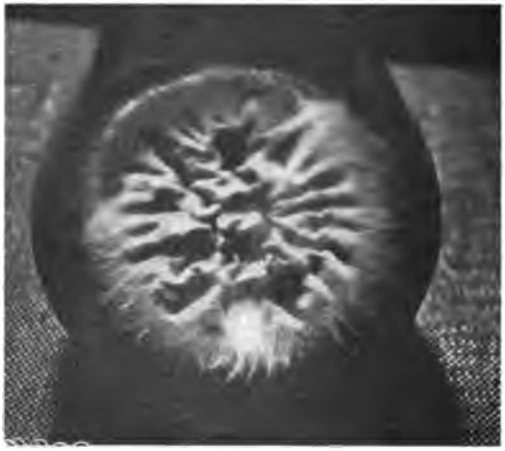

Fig. 5.

To still further lower the barriers between the achorion and the trichphyton I wish to report the following case with cultural experiments.

Case 1.—W. W., aged twenty years, a well-nourished mulatto waiter, applied for treatment at the New York Hospital, out-patient department, August 4, 1901.

Through the courtesy of Dr. P. A. Morrow, I am permitted to report the case.

Clinical History.—The patient denies syphilis, but has at present a gleety discharge from a gonorrhœa contracted about a year ago. The disease for which he seeks treatment began about a month ago with the appearance of a red scaly patch on the inner side of the left thigh, limited to the area in contact with the scrotum. This patch enlarged and spread out on the anterior surface of the thigh, while similar patches appeared in the right inguinal region, on the abdomen, buttocks, and in both axillæ. Simultaneously with the appearance of these patches he noticed a crop of about a dozen small, yellow "cuplike" crusts on the scrotum at the base of the penis. Some of these crusts were removed, but they soon reformed. There was considerable itching and burning in the patch on the thigh. The patch in the right inguinal region was uncomfortable only from the pressure of a truss-pad, which he wore for a right inguinal hernia. The scrotal region gave him no annoyance.

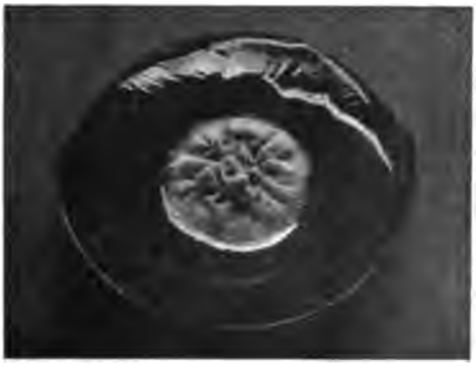

Fig. 6.

Description.—On the inner and anterior aspect of the left thigh (genito-crural region), covering an area as large as the palm of the hand, was a dark red, scaly patch, with an elevated, sharply defined, papulo-vesicular border. This border, formed by the junction of a number of arcs, gave rather a geographical design which was accentuated by scraping with a glass slide to obtain a specimen for the microscope. After scraping the desquamating epithelium away, the central portion was left a shiny red with scattered papulo-squamous "islands." The so-called "*cocarde*" appearance.

The other patches were simply scaly and red, with irregular and sharply defined borders. On the anterior surface of the scrotum at the peno-scrotal junction was a chain of *typical favus cups,* eleven in all, in three groups, one of which was along the scrotal raphé. These favus scutula were of a bright yellow color, softer than those usually found on the scalp, but quite friable, varying in size from that of a large pin-head to that of a split pea, concave on the surface and imbedded in the epidermis. When these cups were removed, there was left a raw, bleeding surface. There were no favus cups in the scalp or on the rest of the body.

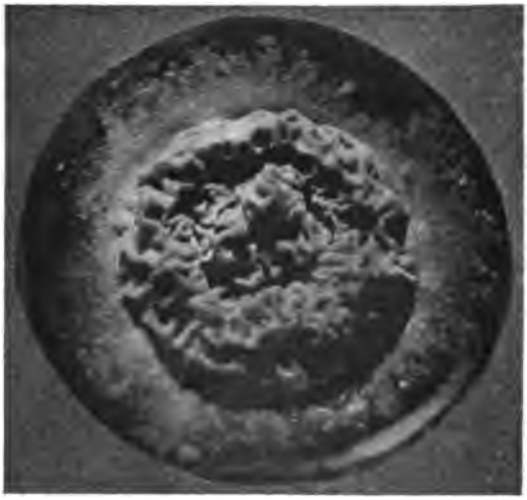

Fig. 7.

Slides were prepared from the favus cups and from the ringworm patches in the following manner: A few drops of glacial acetic acid were added to the epidermic scales which were taken from the different patches. These scales were rubbed between two slides until evenly spread. The slide was allowed to dry in the air, then passed through the flame to fix. Absolute alcohol and ether were then added to remove excess of acid and fat, then stained from one to three minutes in Goldhorn's polychrome methylene blue.* The preparation was cleared in absolute alcohol and xylol and mounted in balsam. When examined under the microscope (with a Zeiss DD. objective) the horny epithelial cells were stained with a pale blue, with a greenish tinge, while the mycelium and spores were stained a dark violet. Some of the mycelial segments were long and slender while others were thick and cuboidal. There were numerous endogenous spores (Fig. 1).The favus cups, when prepared in the same manner and examined, presented an entirely different picture. The mycelium formed irregular, dichotomized, interlocked and clubbed segments, with numerous round and oval spores corresponding to the types found in the favus scalp (Fig. 2). These degenerated forms were only found in the favus cups; all the other patches gave the trichophyton form.

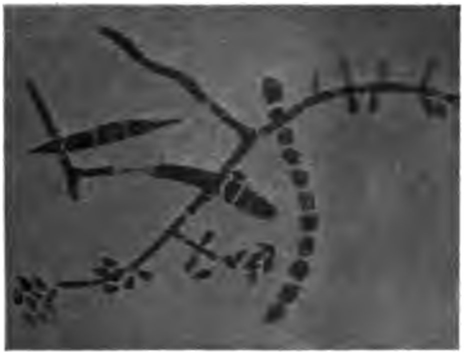

Fig. 8.

Cultures were made from the favus cups and from the different patches on glucose-agar (glucose, 4 per cent.; peptone, 1 per cent.; agar, 1.50 per cent.), and keut at the ordinary room temperature. A pure culture was obtained direct from the favus cups in each of six inoculations. The inoculations from the ringworm scales were contaminated with staphylococci and had to be transplanted several times by the streak method to obtain pure cultures. At the end of a week the downy-white tuft of trichophyton-like growth obtained from the favus cup was indistinguishable from that obtained from the ringworm patch. In Ehrlenmeyer flasks at the end of three weeks' growth on the same media as above, the growth from the patches were more vigorous and formed distinct *crater-like* depressions with radial folds. The circumference formed a raised, sharply defined circular border. Fig. 3). The growth from the favus cup was entirely different from the waxy or *cerebriform* growth considered as typical of favus, but resembled more the acuminate or *button* form of the trichophyton endothrix. The growth was circular, with a rounded central elevation capped in the center by a round button. The margin was slightly irregular and showed an early tendency to the development of a downy pleomorphism (Acladium). (Fig. 4.)

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*Note.—Goldhorn's polychrome methylene blue, prepared by digesting polychrome methylene blue with lithium carbonate and added acetic acid to neutralize, is an excellent stain for epidermic scales suspected of containing skin fungi. The horny cells do not over-stain and thus obscure the field. M.

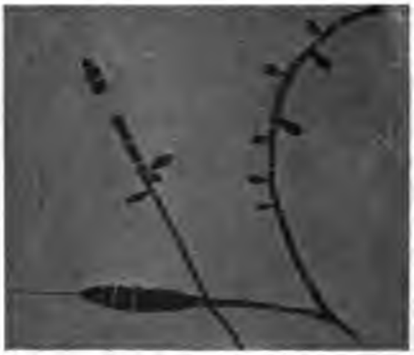

Fig. 9.

On beer-wort agar, at the end of six weeks' growth, the ringworm culture presented a very convoluted central portion and a *fern-leaf* edge. (Fig. 5.) For the purpose of better illustrating the differences between these cultures and the typical favus cultures, two favus cultures on beer-wort agar are shown. (Fig 6 and Fig. 7). These cultures were made from a typical favus cup of the scalp, and in Fig. 6 the growth is shown at the end of three weeks. The growth was then of a waxy, yellow color, humid, convoluted and without any downy covering. In Fig. 7 a culture is shown at the end of three months' growth. In this culture taken from the same scalp, the color was dark brown, with clearly marked *cerebriform* convolutions. The *fern-like* fringe around the circumference is not surface growth, but submerged root fibers.

Cultures made in the hanging drop of glucose-bouillon (2 per cent.), according to the manner described by Sabouraud, gave at the end of from five to eight days interesting means of comparison between the reproduction forms. The drop-cultures from the favus cup and from the ringworm had the same form of reproduction by large fusiform multilocular "spindles" or chlamydospores. These chlamydospores varied in size, averaging 10 *u* x 40, and having from three to six deeply staining granular segments. Some of these "spindles" were provided with slender terminal filaments or "whips." The cell wall did not take the stain.

In some of the drop-cultures from both sources there were, in addition to the chlamydospores, numerous slender hyphæ bearing sessile or "grape-like" spores. These spores seemed attached directly to the stem in the favus culture, while the spores in the ringworm culture were attached by means of sterigmata. These spores, or *gonidia*, were about 2 *u* to 4 *u* in long diameter, oval in shape and very easily detached. (Fig. 8 and Fig. 9.) The general outlines of one of these drop-cultures may be seen in Fig. 10.

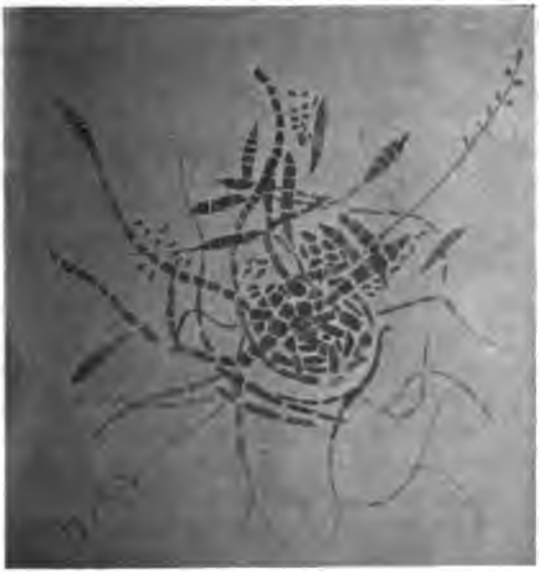

Fig. 10.

Inoculation Experiments.—Two inoculations from the favus cultures were made on the author's left forearm at intervals of three weeks, but with negative results. Three ordinary house mice were next selected for experiment on account of Sabouraud's success in obtaining downy growth from favus of mice. These were inoculated with the favus culture with negative results. January 31, '02, successful inoculations were obtained from the *ringworm* cultures of the thigh. A rabbit, weighing a little over five pounds, was inoculated on the back in the following manner: An area of two square inches was shaved, cleaned with ether and well scarified as if for vaccination; the culture from glucose-agar was well rubbed in on the point of a sterilized scalpel. At the end of one week (Feb. 7), a few pin-head sized favus cups had developed. At the end of two weeks (Feb. 15) a large conglomerate favus cup, about three-eighths of an inch in diameter, had developed. There were a number of smaller cups scattered over the patch, most of which were perifollicular, being centered by a hair. These cups were oval to circular in form, sulphur yellow in color, dry and friable, concavo-convex, and when removed left raw and bleeding surfaces. Stained preparations made from the cups showed irregular and dichotomized mycelium as well as short jointed chains, but there were no epilated hairs found to contain any mycelium in the hair shaft or hair follicle. Unfortunately, while waiting for the further evolution of the lesion, the itching must have induced the rabbit to rub his back against the cage, leaving a raw, bleeding surface. No more cups formed, but the patch became papulo-vesicular, resembling a true *kerion Celsi*, clearing up entirely at the end of a month. Cultures from the experimental favus cups made on glucose agar gave, at the end of two weeks, typical crater-like trichophyton growths. A guinea-pig was inoculated from this culture, but the result was negative.

Résumé and Conclusion.—While it would seem unwarranted to draw any conclusions bearing on the question of the identity of the Achorion and the trichophyta from this isolated case, nevertheless it does seem to the author that this case may be regarded as one in which the same trichophyton (a megalosporon ectothrix of probably animal origin) on the same patient, but in different parts of the body, where the conditions of soil were different, produced two clinically distince diseases—favus and ringworm.

The irregular and interlocked mycelium found in the favus cups were then only degenerated forms due to a lack of the best suited conditions in the soil for its most vigorous development. This conclusion would seem to be in accord with the very elaborate experimental study of the Anchorion Schönleinii made by Bukovsky,[7] in which he found that "the more indifferent the skin is to the fungi (Achorion), the more likely it is to show the favus cup. The stronger the reaction of the skin against the mycelium, the less the tendency to scutulum building."

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Description of Plates—Dr. A. D. Mewborn's Article.

Fig. 1. Microscopical preparation from ringworm patch. Thick septated as well as slender and branched mycelium. Endogenous spores. X 800.

Fig. 2. Microscopical preparation from favus of the scrotum. Branched, interlocked, and clubbed mycelium with round and oval spores. X 1000.

Fig. 3. Cultures in Ehrlenmeyer flasks on glucose agar from ringworm patch at the end of three weeks' growth. Crater-like appearance. One-half life size.

Fig. 4. Cultures in Ehrlenmeyer flasks on glucose agar from favus-cup at the end of three weeks' growth. Button-like growth. One-half life size.

Fig. 5. Culture in Ehrlenmeyer flask on beer-wort agar from ringworm patch at the end of six weeks' growth. Convoluted central portion with "*fern-leaf*" edge.

Fig. 6. Culture in Ehrlenmeyer flask on beer-wort agar from favus of the scalp at the end of three weeks' growth. Growth of a waxy-yellow color, humid, convoluted and without any downy covering. Nearly life size.

Fig. 7. Culture in Ehrlenmeyer flask on beer-wort agar from favus of the scalp at the end of three months' growth. Elevated, humid, dark brown, "*cerebriform*" growth. The "*fern-like*" fringe around the circumference is not surface growth, but submerged root fibers seen by transmitted light. One-third larger than life size.

Fig. 8. Hanging drop cultures in glucose bouillon from ringworm growth. Showing *chlamydospores* as well as *gonidia* attached by sterigmata.

Fig. 9. Hanging drop cultures in glucose bouillon from favus of the scrotum. Showing *chlamydospore* with terminal "*whip.*" Both Fig. 8 and Fig. 9. X 1000.

Fig. 10. General outline of a drop culture. X 500.

EDITORIAL

TUBERCULOSIS OF THE TONSILS IN CHILDREN

At one time in the history of medicine it was thought that tuberculosis of the tonsils in children was a rare affection. It is now recognized to be comparatively frequent.

The researches of many pathologists, both working by post-mortem and by experimental methods, have demonstrated its frequency, but by reason of the extreme difficulties connected with its detection, the disease often remains undiagnosed.

The usual method of infection of the tonsil is by means of tuberculous sputum, in which case naturally the tonsil is but a secondary involvement, the parent indus being in the patient's own throat. The primary infection, however, in children probably results either from the lodgment of tuberculous food in the tonsillar crypts, or by means of the breathing in of the tubercle bacilli. The chances seem to be with the former, for experimental tuberculosis of the tonsils has been communicated by means of infected food, but never by means of breathing experiments. In very young children in whom mouth breathing is by no means uncommon such a means of infection is not unthinkable.

In a recent clinical study by Kingsford (*Lancet,* Jan. 9, 1904) a number of interesting cases of tuberculosis of the tonsils are reported, some primary, others secondary to tuberculosis elsewhere.

In 17 cases tuberculous lesions were found. In three only, however, were the naked eye appearances of any value in making a diagnosis. One showed an ulceration, another a scar, the third a carious spot.

The parts of the tonsils most liable to be involved were the lymphoid follicles, situated not far from the epithelial surfaces. In no instance was the author able to trace bacilli into the depths of the crypts or surface of the tonsils. The author further notes that few cases of tuberculosis of the tonsil have seemed to occur in hypertrophied tonsils which have been removed by operation.

As to the tonsillar route of entry of the tubercle bacillus into the body the author says that it seems hardly likely that the bacillus would frequently pass through the tonsil and yet leave behind no trace. In view of the small number of primary tonsillar tuberculoses he does not believe that we are justified in going further than to say that the tonsil is a recognized channel of infection, but the evidence seems strong against Aufrecht's contention that the tonsils are the most important avenues of entrance for the tubercle infection.

APPENDICITIS IN THE YOUNG

Appendicitis in the adult has become more than a twice-told tale, but for the young and particularly in infancy we are greatly in the dark and much in need of all the help that observation and experience can throw on the subject.

Stomach ache in boys is not an uncommon affection. Their surreptitious diet is often very different from that which their care-taking parents are wont to believe is their sole sustenance. Yet any stomach ache is open to suspicion. It may be but the clamor of an outraged digestion or it may be an appendicitis, and yet if every case of stomach ache were diagnosed as appendicitis most of our schools for boys would be half empty during most of the year.

To err on the other side is also to invite certain death, as some of the selfsame stomach aches are forerunners of the most disastrous fulminating types of appendicitis.

How are they to be told apart is one of the questions taken up by a recent writer, Sir William Bennett, Senior Surgeon, St. George's Hospital (*Lancet,* Jan. 2, 1904), in a clinical lecture given at that institution. Speaking generally, he says, that the ordinary stomach ache is acute, and passes off rapidly, perhaps with an attack of diarrhea and vomiting, or not. It is rarely associated with a rise in temperature, and in passing off it usually does so at once and is done with. Further, although the rule is not absolute, the pain is apt to be general and usually passes to the left side as the colon becomes the localized seat of the diarrheal disturbance. In the appendix stomach ache, however, there is usually a marked rise in the temperature, it rarely passes off, not to recur again, and the after pain tends to gravitate towards the right side, often in its typical position, sometimes over the gall bladder, rarely higher up, suggesting even a pleurisy. A sign of value then is present in children, a sense of discomfort when the little patient "stretches" the lower limbs. This is rarely present in ordinary stomach ache.

Bennett further dwells on the faces of these younger patients as a useful diagnostic indication of the severity of the appendicular involvement. A flushed face, inclined to duskiness, black lines beneath the eyes, a furred tongue, and evident distress, taken in conjunction with the ordinary signs, these, he thinks, carry a very definite meaning, and yet at times the boy who says he is all right, whose symptoms have improved and who wants to be "let alone" may really be suffering from a toxemia, and gangrenous perforation be imminent. Decrease of pain is a deceptive sign, it may mean improvement, it may be benumbing of the patients sensory nervous system from toxemia.

With reference to temperature. In the young this is extremely deceptive. A fall from 102° F. to 99° F. with apparent improvement is extremely common. Yet it is not to be relied upon. One of the commonest precursors of gangrene in these patients is a drop of temperature. A gradual fall is nearly always a good sign, a sudden fall means, beware!!

SOCIETY PROCEEDINGS

PHILADELPHIA PEDIATRIC SOCIETY.

November 10, 1903.

The President, Dr. D. J. Milton Miller, in the Chair

MARKED DIASTASIS OF THE RECTI MUSCLES.—Dr. Albert P. Francine exhibited this patient, who was a male colored baby, fifteen months old, that exhibited the signs of advanced rickets, including the rachitic head, open fontanelle, anterior bowing of the tibia, enlarged epiphyses, etc., and was exhibited on account of the marked diastasis of the recti muscles. While this condition is not rare in infants of this type, Dr. Francine had not previously seen so marked a case, the diastasis being fully the width of three fingers. The chest was small and rachitic; the abdomen full and prominent. It had been tender and painful to the touch, and the baby had suffered with some gastrointestinal disturbance with constipation, which had improved under treatment. The baby is now enjoying fairly good health, and its nutrition seems good.

Dr. Francine thought the condition of the recti muscles originated at or soon after birth. This child had been observed a year previously, when the condition was equally well marked. It was thought by the speaker to be due to a want of tonicity on the part of the abdominal muscles, that was a part of a hereditary predisposition to weakness of both the bony and the muscular system of the body. This, in some cases, eventually gives rise to the visceral ptoses so frequently noted in later life, particularly in women.

Dr. Hamill thinks that diastasis of the recti muscles very common as a manifestation of rickets, especially in colored children. In a patient but little older than the one just exhibited, recently seen by Dr. Hamill, there was a separation of the recti muscles almost as marked as in this case.

He believes that the lowered tone in the muscular coats of the stomach and intestines causes deficient motor power, defective digestion, fermentation, the formation of gases and consequent gastric and intestinal distension. The resulting pressure against the poorly nourished and weakened abdominal muscles produces the separation of the recti muscles. He is not in accord with Dr. Francine in considering the condition congenital.

In conjunction with Dr. Francine's case, Dr. Hamill exhibited a colored boy, aged fifteen years, who had been under observation in the Polyclinic Hospital for two years. When he first came to the dispensary he was much emaciated, had severe intestinal indigestion, his abdomen was enormously distended, and the separation of the bellies of his recti muscles was extreme. Under improved conditions of diet and exercise and by abdominal support, the muscles had developed, the separation had become less marked, the intestinal symptoms had practically disappeared, and the boy had gained rapidly in weight. The persistence of the extreme separation in this case was what had induced Dr. Hamill to present him. The patient had had extreme rickets in infancy.

Dr. D. J. Milton Miller said he was quite in accord with what Dr. Hamill had said in regard to the frequency of minor degrees of this condition, especially in rachitic infants. He thought Dr. Francine's case one of the most marked that he had ever seen. Those seen by the speaker were due to rickets; that is, they were acquired, and not congenital.

Dr. Edwin E. Graham had expected to present a patient with Hodgkin's disease, but the child had shown such a rise in temperature that it had not been considered safe to remove him from the hospital. Dr. Graham, therefore, merely exhibited some photographs of his patient illustrating the condition described.

Dr. J. P. Crozier Griffith thought it interesting that Hodgkin, in describing the disease that bears his name, mentions some cases occurring in children. In medical literature in general the disease is very uncommon in early life, although there are cases recorded that occurred in infancy. The question always arises whether these cases are not, in reality, cases of tuberculosis.

Dr. Graham said that Sternberg has recently done some extensive work with cases of Hodgkin's disease, and has come to the conclusion that the majority of these are tuberculous in origin. Dr. Musser, also, has lately assented to this conclusion. Dr. Graham does not think it possible, either ante-mortem or post-mortem, to prove the correctness of this view, except by inoculation experiments; because the changes in the lymph nodes and the histologic changes are not such as to render it possible to say whether or not they are tubercular. Therefore, the decision whether the disease is or is not tubercular in this case will have to depend upon the result of future inoculation experiments.

Congenital Elephantiasis.—Dr. Ralph Pemberton, by invitation, exhibited this patient.

Dr. Jopson said that he had exhibited this child and the other mentioned by Dr. Pemberton to the Society six or seven years ago, at one of its first meetings, and had then lost sight of them until within the last week or two. When he exhibited them he was in doubt as to the exact nature of the disease; but Dr. Stengel suggested that it might be lymphatic in origin. After having studied the cases further, and having investigated the literature of the subject, the speaker had come to the conclusion that they are true congenital elephantiasis. According to E. Marchand and Halenkampf, these cases are of two types: those due to hypertrophy and overgrowth of the lymphatics, and those due to hypertrophy and overgrowth of the blood vessels, fibrous tissue, or nervous tissue.

The reason that Dr. Jopson considered these cases to be lymphatic is that there is an absence of any signs of vascular telangiectasis of the skin, of fibromata locally or anywhere else, and of dilatations along the superficial nerves, and because of the appearance and nature of the swellings. Some cases have been reported in which the disease occurred in several generations of the same family—six generations in the family studied by Milroy. The hereditary nature of this disease has been pointed out by many authors; indeed, the persistence with which the deformity crops out strongly reminds one of hemophilia.

The changes that have taken place in this boy since he was exhibited by Dr. Jopson are a diminution in the size of the right leg and an increase in that of the left. There must have been an infective process going on, because pustules were present, the remains of which can now be seen. There is a subacute lymphangitis in the limb, which is hot and slightly reddened, and the changes are similar to those described as occurring in cases of true tropical elephantiasis—endemic elephantiasis—due to filarial infection. He does not think that there is any question of filarial infection in this case, however, because this is a disease that has run through several generations, and has probably never been seen in tropical countries. Most cases of it have occurred in Europe. It is due to congenital malformation of some of the soft tissues. Cases are very rare in this country.

Dr. Jopson replied that the condition is now less marked in the other boy than it was six years ago. It has never extended above the ankles in the case of the younger brother. The child at first had to wear special shoes, but this is no longer necessary. He never has attacks of inflammation, and seems to be in a fair way to get into a condition resembling that of his father.

Dr. Pemberton replied that elevation causes no marked change. He also said that a blood examination had been made, but not for filaria. No abnormality in the number of red cells was found.

ARREST OF CEREBELLAR DEVELOPMENT.—Dr. J. H. McKee presented this patient. He was a four-year-old boy, who had a remarkably good family history. The mother had never had a difficult labor, nor had instruments been employed when the boy was born. He did not have asphyxia neonatorum. His first year was uneventful, barring some unaccounted for "blue spells" when three weeks and when seven months old. He had never had any infectious disease. Indeed, his mother had noted nothing unusual about the child until he reached the age when he should have talked and walked. He has never walked, and he did not talk until last summer. During the past summer he had six convulsions, two at a time, and following the first, internal strabismus appeared. The most conspicuous nervous feature of his case is the marked ataxia that is exhibited in nearly every act he endeavors to perform. When he is assisted to walk, he throws his legs out like a patient with locomotor ataxia, and exhibits a strong tendency to fall backward. Dr. Spillar regards his case as one of arrested cerebellar development. Dr. Posey made a careful study of the child's eyes, found him highly hypermetropic, and referred him to Dr. Langdon for refraction. He has apparently improved under tonic treatment and exercises intended to improve his coordination.

Dr. Wharton Sinkler said that the chief interest of the case depends upon the differential diagnosis between cerebellar degeneration, or arrest of development, and Friedreich's ataxia. In cases of cerebral arrest of development there is always a history of traumatism at birth, or of conditions that have led to hemorrhage; but in this case there has evidently been either an arrest of development or a degeneration in the cerebellum or in the cerebellar tracts that is not dependent upon birth injuries, giving rise to incoordination of movements and inability to walk. The speaker considers it an open question whether the case is one of arrest of development or of degeneration of the cerebellum. The fact of the child having been so tardy in general cerebral development—its slowness in learning to speak—indicates an intracranial disorder rather than a cord lesion; therefore, Dr. Sinkler also thinks that the trouble must be regarded as cerebellar rather than of the cord. It resembles the cases of cerebellar ataxia that have been described. The condition is a rare one, and the experience in the past has not been wide enough to throw any light upon the pathology of the disease.

Dr. Hamill said that as there was neither an operation nor an autopsy in the first case described by Dr. McKee, it could not go on record as one of perforation in typhoid fever. He was unable to induce the surgeon, whom he called in consultation, to operate, and the parents would not permit an autopsy to be made. The patient, unilke those referred to by Dr. Griffith, had the classical signs of perforation. There was sudden pain, collapse, a fall in temperature; later the abdomen became distended. the child had an expression of anguish and all the symptoms of peritonitis developed rapidly; the temperature became elevated, and the patient died within forty-eight hours of the onset of these symptoms.

Dr. J. Madison Taylor said, in support of Dr. Sinkler's view, that the case seems more like cerebellar than like cord trouble; that in the cases of Friedreich's ataxia that he had seen, the general condition had suffered more and tremors had often been present, and that they had often shown more nutritional disturbances than this child exhibits.

Dr. McKee said that upon first seeing the case he had been struck with the history of cyanotic spells in early life. There was no history of congenital cardiac disease, nor could anything be found suggesting this. There was no history pointing to infection of the new born. Cyanosis is quite frequently observed shortly after birth in infants that have suffered cerebral hemorrhage; and Dr. McKee at first thought that there had been a cerebral hemorrhage in the unmapped region of the cortex. Friedreich's ataxia was at that time excluded on account of the sharp reflex that the speaker thought he had secured; but Dr. Spiller later tested the reflex with the percussion-hammer, and secured it only twice out of a number of attempts. Dr. Spiller said, therefore, that he could not positively exclude Friedreich's ataxia, though he believed the lesion to be cerebellar.

STAPLE AS A SWALLOWED FOREIGN BODY.—Dr. Hamill showed a heavy wire staple measuring 5-16 of an inch in width and 2¼ inches in length and having very sharp points. The staple had been swallowed, rounded end first by a three-year old child. No treatment was inaugurated and no symptoms were manifested until the tenth day, when the child had twinges of pain in the rectum and passed small particles of blood. Digital examination made at this time showed the points of the staple impinging against the spincter ani.

It was successfully delivered by the mother, who was instructed to introduce her finger into the rectum when the child expressed a desire to defecate, to place it against the points of the staple, and to guide the points as they were pushed down in the act of defecation.

The specimen had been sent to Dr. Hamill by Dr. Eiseline, of Shortsville, N. Y.

Dr. Myer Solis Cohen said that while a resident in the Children's ward of the Philadelphia Hospital he had been handed by a nurse an open safety-pin that had been passed by a child who had previously evinced no discomfort. He said that it is not uncommon for persons that have swallowed small articles to pass them without any trouble. It is said that the pickpockets of London swallow stolen jewels, and then eat potatoes or soft bread, after which these articles are passed by them without difficulty. Not long ago a man swallowed a dental instrument. He was examined by a laryngologist, who discovered the instrument in the man's oesophagus. A diet of potatoes and bread was prescribed, and the instrument was passed in the course of a day.

PERFORATED TYPHOID ULCERS.—Dr. John H. Jopson reported a case of perforated typhoid ulcers in a child of six years treated by operation. The perforation had taken place at the beginning of the third week of the disease, and the patient had not been admitted to the hospital until general peritonitis had developed, twenty-four or forty-eight hours after perforation had occurred. The perforation was located eight inches from the ileocecal valve, in the ileum. It was small and round, and the neighboring gut-wall was healthy. The perforation was easily sutured, and the abdominal cavity was irrigated and drained. The patient lived seventy-two hours after the operation, dying of general peritonitis. After death, the perforation was found to be tightly occluded. The general condition before and for twelve hours hours after the operation was very fair, considering the lesions found. This emphasizes Elsberg's conclusion that in children shock is not usually marked after perforation. That author found the prognosis to be twice as good in children as in adults, and perforation to be nearly as common, in proportion to the number of cases, between the ages of six and fifteen years. Elsberg's case, the youngest operative case that Dr. Jopson had found reported, was six and a half years old. This patient's age was six years.

Dr. Griffith was inclined to think that Elsberg's statistics are nearer correct than are some of the previous ones met in the text-books. In some of the latter many of the cases reported must be excluded, because one cannot be sure that they were undoubted cases of perforation, since they recovered without operation. After having watched our literature to a considerable extent, the speaker has been brought to the conviction that his own experience in having seen quite a number of cases is not so very unusual. He could recall five cases of perforation in typhoid fever occurring in children coming under his own observation, all confirmed by autopsy. He has found the diagnosis of this condition in children to be extremely difficult—much more so than in adults. The classical symptoms of perforation are not so often present in early life. In only one of the five cases in children was he able to make a diagnosis sufficiently positive to warrant his taking such a serious step as to open the abdomen of a child already seriously ill with typhoid fever The details of the cases he intends to publish at some future time.

Dr. McKee said that Dr. Hamill and himself had had an unusual experience, having had two cases of perforation during typhoid fever in childhood within about six weeks. The first occurred in Dr. Hamill's service. Dr. McKee was much interested in this case, because he had sent the patient to Dr. Hamill. The other patient, a little girl, was sent to Dr. John B. Roberts as a case of appendicitis. She had been ill for two weeks, suffering with severe abdominal pain and with vomiting throughout that time. She had been placed upon the operating table, when some suspicious spots on the abdomen were noticed, and the operation was deferred. I was asked to see the child, a colored girl about six and a half years of age. The facial expression was that of a very ill child. The tongue was heavily coated. There was a rather well-marked catarrhal pneumonia at both bases, but principally at the right. The abdomen was tense, and so tender that a satisfactory examination could not be made. The resistance offered by the right rectus, however, was much greater than that offered by the left. Dr. McKee regarded the case as one of appendicitis, and advised operation; but the leukocyte count and the Widal and diazo reactions enabled him to make a correct diagnosis subsequently. He thinks that, paradoxical though the statement seems, had the proper diagnosis not been made, the child's life might have been saved. There were slightly more that 4,000 leukocytes, and positive Widal and diazo reactions were obtained. The temeperature that afternoon was over 104. The following morning it fell to 101, and there was a commensurate improvement in the pulse, which was stronger and slower, and in the respirations. The pain also disappeared. The patient had no exacerbation of the abdominal symptoms. The same day, on account of the laboratory results and of the great improvement in the child's condition, it was decided to defer operation. Dr. McKee did not see her the day after this, but the Resident informed him that she had remained comfortable through it. Early the following morning the night nurse found that the patient was decidedly weak, and she died soon afterward. An autopsy was made, and it was found that there had been a perforation and septic peritonitis. The abdomen was filled with recent lymph and some pus. Catarrhal pneumonia was also found. Dr. Hamill was present at the autopsy, as he was much interested in the case.

Dr. Hamill referred to an autopsy upon a new-born infant made by him, in which marked bony deformities and an extremely small cerebellum had been found. The cerebellar fossa was just about one-quarter of the normal size. Dr. Hamill thought it interesting, in connection with the case just exhibited, to speculate upon the course that his case would have pursued had the child lived beyond the age of infancy.

NEW YORK ACADEMY OF MEDICINE

SECTION ON PEDIATRICS

Stated Meeting, Held October 8, 1903.

HENRY HEIMAN, M.D., President.

GANGRENE OF TOES IN A NEW-BORN INFANT.—Dr. S. V Haas presented an infant, four weeks old, born by the aid of forceps after a tedious labor. The day after its birth the left lower extremity was noticed to be cyanotic up to the knee. After about one week a general eruption appeared, which was stated to resemble prickly heat. When ten days old there was an attack of enterocolitis. When first seen by the speaker, one week ago, the left foot was swollen and the great toe and last phalanx of the second toe were black and gangrenous, necessitating immediate amputation of the affected part. Enlarged glands could be felt in the neck, axilla, and groin. The case was presented for diagnosis.

Dr. Martin W. Ware said that he suspected the case was one of syphilis, because of the involvement of the bone. If only the soft parts had been involved he would be disposed to think that the condition was the result of embolism, originating in infection of the umbilicus.

Dr. Sara Welt-Kakels said that she was interested because she now had under her care a child of twenty months with gangrene of the little finger of the right hand, and, in addition, an erythema nodosum. It was thought that originally there had been a spot of that kind on the little finger, and that it had become gangrenous as a result of the application of some strong lotion. In other respects the child appeared to be well.

Dr. L. E. LaFetra said that he understood that in the child presented there was dry gangrene present at first, produced by embolism. He was far from being convinced that the disease was specific.

Dr. H. Heiman remarked that the disease being unilateral would also be against its being luetic. He would like to know whether the mother had received ergot during labor.

Dr. Haas said that the liver and spleen were apparently normal and the family history was negative. The urine had been examined with negative result. He had at first been inclined to look upon the case as possibly one of dermatitis exfoliativa neonatorum of Ritter. He did not think the patient had received ergot during parturition.

The Hemorrhagic Diseases and Their Allies in the Light of Modern Pathology.—Dr. F. L. Wachenheim read this paper. He said that the customary inclusion of the hemorrhagic diseases in the blood diseases was extremely unsatisfactory. Spontaneous hemorrhage was caused by the yielding of the intercellular cement of the vascular wall as a result of the impairment of nutrition. Authorities did not agree as to whether the malnutrition or the thrombosis was the prior condition. Degeneration of the vascular endothelium must follow deficient food supply or the presence of a poison in the blood. Experience had shown that these two factors were invariably combined. It should be borne in mind that toxins differed only from true foods in that they damaged the cells. Potassium chlorate was an excellent example of the class of poisons which destroyed the hemoglobin; the nitrites acted in a similar manner. Apart from the hemoglobin poisons, the blood poisons presented nothing distinctive. Recent investigation had shown the action of the toxins on the blood cells to be somewhat complicated. Snake poison might be regarded as a type of blood toxin. Obstructive jaundice presented certain features which were closely allied to those of hemophilia. In icterus there was no evidence of special blood dissolution or hemolysis. Agglutinins had been demonstrated in the blood in jaundice, and such formation of agglutinins we knew only occurred in the presence of toxemia. The characteristic feature of hemophilia was not so much spontaneous bleeding as deficient coagulation. The symptoms of scurvy closely resembled those of chronic mercurialism, and it was evident that this disease was due to a chemical poison. It was now generally accepted that scurvy was the result of an exclusive diet on certain articles of artificially prepared food. The speaker was of the opinion that scurvy and rachitis unquestionably belonged to the same group. He then passed in review the chemical blood poisons, non-infectious toxemas and infectious toxemas. The conclusion wa sreached that spontaneous bleeding by itself formed a most unsatisfactory pathological basis for classification. Some observers looked upon scarlatina, rheumatism, and ordinary sepsis as only different forms of sepsis. Endocarditis frequently followed tonsillitis without any of the usual rheumatic manifestations. He had seen typical rheumatic endocarditis combined with chorea in children who had never presented appreciable joint symptoms, but only moderate soreness and tenderness. The relation between chorea, rheumatism, and endocarditis was now generally conceded to be direct and intimate. Purpura hemorrhagica represented a group of infectious diseases of the septic type.

Etiology of Rachitis.—Dr. P. W. Nathan presented this paper. He said that the gross pathological anatomy of rachitis is well and definitely known; and it would add unduly to the length of this paper, were I to speak of it in detail. The lesions in the skeleton are the most constant and characteristic, and these must form the basis for any attempt to explain the nature and cause of this disease. These are therefore very briefly described:

The characteristic lesions appear at the growing ends of the long bones, causing a disturbance of the inter-cartilaginous ossification. These changes may be enumerated as follows: (1) Defective calcification of the proliferating cartilage; (2) defective calcification of the new formed ostoid tissue; (3) increased vascularity; (4) hyperplasia of the proliferating cartilage cells. The vascular and hyperplastic processes are not, as has been shown by Pommer, directly connected with the pathogenesis; but are due to external and purely mechanical influences. The essential part of the pathological process is the defective calcification; for aside from the changes just noted the bone is normal. The ostoid tissue formed is in no way different from that formed in normal bones; the periosteum, aside from defective calcification and changes due to mechanical influences, shows no change; the medulla of the bone is not altered; and contrary to the opinion of some authors the resorptive processes are not increased.

Pommer has proved that the defective calcification is due to a dissolution of the previously deposited lime salts in such rare instances that we may disregard it entirely; we must therefore conclude that, primarily, the bone lesions of rachitis are defective calcification of the cartilage and newly formed bone.

Up to the present time, no local condition has been found which can be considered the cause of the defective calcification. Ou tne contrary, as I have pointed out, the local conditions in the bones are either secondary to it or are due to external physiological influences. Such being the case, we are perforce compelled to seek an explanation of the anomaly outside of the skeleton. And as the skeleton as a whole is uniformly and constantly affected in the same way, we must assume that this anomaly is of a general or constitutional character. This assumption is borne out by the other lesions and symptoms of rachitis: the enlargement of the spleen, the hydrocephalis, the nervous phenomena, the intestinal disturbance, the bronchial catarrh, etc., all point to a constitutional vice as the cause of the anomaly. Hence the etiology of rachitis must be sought in a condition or series of conditions, which are inimical to the calcification of the growing bones.

This being granted, the subject can be studied from two standpoints: we can assume that a constitutional anomaly is the cause of the inhibition of the calcium deposition, and attempt to explain the nature and cause of rachitis by investigating the cause and nature of this anomaly; or we can assume that a deficiency in the amount of the calcium within the organization is instrumental in producing not alone the faulty calcification but also the constitutional anomaly.

Ever since the discovery that rachitic bones are deficient in inorganic salts, the latter assumption has been the basis, or at least the starting point of the majority of the investigations on the etiology of rachitis. The deficiency of calcium within the organism has most frequently been attributed to one of two conditions: either the calcium of the food is deficient; or, that not being the case, the absorption of the calcium is defective. Experimentally, it has been definitely proved (E. Voit, Roloff) that total absence of calcium in the food, when the food is otherwise suitable, and sufficient in quantity, will induce the true rachitic bone lesions in growing animals. But such a combination of circumstances as total absence of calcium in a food otherwise suitable, does not occur naturally; and clinically rachitis cannot be said to arise from such a condition of affairs. The calcium in the human milk, the milk being otherwise normal, is always ample for the needs of the infant metabolism; cow's milk and other "infant" foods, contain either sufficient or even an excess of this substance.

Consequently, if we still adhere to the theory of deficient calcium, we must assume that the absorption is defective. To prove this a vast number of experiments and researches have been attempted, and this theory has, I believe, been accepted by the greater number of medical men. Uffelmann and Escherich examined the feces of artificially fed children and found that the calcium was always greater in these than in the feces of breast-fed children, and they concluded from this that the calcium assimilation is not as perfect in the former as in the latter. That the absorption of calcium is defective in rachitic children seems, moreover, to be borne out by the investigations of Seeman, who found that the amount of calcium in the urine of rachitic children is diminished. Seeman attributes the faulty assimilation to insufficiency of the HCl in the gastric juice. To account for this he adduces Bunge's sodium chloride theory, which supposes an excess of K in the food, causing an NaCl deficiency and consequently a deficiency of HCl secretion. Zander believed that he had proved this assumption to be correct by demonstrating that in the milk of a number of mothers nursing rachitic infants, the relation of the K to Na was in favor of the K. In a very elaborate monograph on the etiology of rachitis Zweifel has gone over this ground very fully, and he believes that he has placed the theory of deficient HCl and consequent faulty assimilation of calcium upon a firm basis.

By withdrawing the NaCl from the food (vegetable diet) of nursing women he hoped to induce a NaCl deficiency, which, he argued, would have a twofold effect. In the first place it would diminish the amount of calcium assimilated by the mother, and thus diminish the amount in her milk; in the second place it would diminish or eliminate entirely the supply of sodium chloride to the child, which in turn would inhibit its power of absorping calcium. Thus he hoped to induce rachitis. His results, however, were not favorable; and he found that the reason for this was that no matter how strictly he eliminated the NaCl, the maternal organism was still able to extract a sufficient amount from the food to keep the quantity in the milk within a certain limit. Nevertheless he considers Zander's and Seeman's observations conclusive; and concludes that in nursing infants rachitis is caused by a deficiency in the HCl and a consequent malassimilation of calcium. That such a lack of NaCl in the food of nursing mothers can occur under other than experimental conditions he considers proved by the fact, that in Saxony, where it is a national peculiarity to take black bread without salt, rachitis is unusually frequent and of an unusually severe character.

However, as these observations are capable of explaining the pathogenesis of rachitis in nursing infants only, if at all, he proceeded to investigate the relation of these facts to artificially fed infants. In order to discover the fate of the calcium after its ingestion, he performed a very extensive series of test tube experiments in the digestion of cow's milk. As a result, he found that the dissolved calcium salts of the cow's milk are, to a very large extent, changed into insoluble combinations when the milk is coagulated by the milk-curdling ferment. When the milk is boiled, the amount which becomes insoluble is even greater, so that the quantity of soluble calcium which remains after coagulation is below that contained in an equal quantity of human milk. The insoluble calcium salts in the milk curd can be redissolved in only one way, that is, by the presence of an acid—in the case of the infant's stomach, HCl. It depends, therefore, upon the quantity of HCl in the stomach whether or no, a sufficient quantity of calcium is made soluble and absorbed. If the HCl is deficient a calcium deficiency occurs in spite of the excess of calcium in the cow's milk. From this he concludes that, whenever, either as a result of the action of Bunge's law, or as the result of a primary deficiency of NaCl, a deficiency of HCl occurs, rachitis will be induced.

Zweifel's monograph is very interesting and embodies a vast amount of time and work; moreover, it represents the highest development of the theory of deficient absorption of calcium as the cause of rachitis. However, in spite of the accurate and scientific manner in which his individual experiments were conducted, this hypothesis must inevitably fall to the ground. Granting that the experiments themselves and the conclusions to be drawn from them are perfectly scientific and accurate; as a complete entirety the theory is false; necessarily false, because the premises upon which it is founded are fallacies.

Zweifel assumes, upon what ground he does not state, that the HCl secretion is absent or very deficient in early infancy, and continues so for some time after, though there is abundant evidence to the contrary. He also assumes that besides the natural deficiency, a further deficiency is induced by lack of NaCl within the infant's organism, and adduces Bunge's law to prove this.

As far as the latter assumption is concerned, it takes very little insight to appreciate that Bunge's law has only a very limited application in this respect. Excess of K in the food no doubt produced a NaCl loss within the organism, by the combination of the K with the Cl and the subsequent excretion of the KCl thus formed; but this replacement of the Na by the K only continues so long as the NaCl within the body is in excess of what is absolutely necessary to the organism (Cv. Voit). Otherwise the organism tenaciously holds its NaCl; and unless very unusual and very unnatural conditions prevail, there is always a sufficient quantity retained to prevent NaCl starvation. Zweifel's own experiments prove this; for although he forced nursing mothers to consume vegetable food, poor in NaCl, and eliminated all other sources of NaCl, he was unable to reduce the NaCl in the milk of the mother, or that in the urine of the child beyond a certain point; that is, he was able to induce NaCl deficiency in neither mother nor infant.

However, even were it true, which it is not, that by the entire elimination of NaCl, except that naturally contained in the food, NaCl starvation could be induced, this would not prove that NaCl deficiency is the cause of rachitis. Such a peculiarity as eating food without the addition of salt does not exist, even among the most poor and destitute. That the black bread of Saxony is baked without salt does not indicate a general tendency in this direction; Zweifel himself considers this a local peculiarity. Yet rachitis, as all medical men can testify, occurs in nursing infants outside of Saxony, and in this country where we are particularly partial to salt, it certainly is not rare.

But even were we to assume that a NaCl deficiency could occur from natural causes this would not constitute proof that such a deficiency is the cause of rachitis. It would first be necessary to prove that the calcium is absorbed in the stomach; and could only be absorbed if it were dissolved by the HCl contained in the gastric juice. But this has never been proved; on the contrary, such an assumption is opposed by a number of physiological facts. In the first place only a very small amount of calcium is taken in, and is necessary for the organism, no matter how much is present in the food ingested; secondly, all dissolved calcium salts if absorbed are precipitated by the alkaline body fluids. These and other physiological considerations lead us to conclude that only a very small amount of calcium, which is in combination with organic substances, thereby retaining its solubility, is assimilated.

These theoretical considerations are, I think, more than sufficient to show that the deficient NaCl hypothesis is untenable. However, leaving them aside, I believe the experiments and observations, of which I shall give only a summary here, make it certain that, while the bone lesions of rachitis may be induced by the elimination of the calcium from the food, such an absence of calcium from the food is not the cause of clinical rachitis; that in fact the lack of calcium cannot be held responsible for its causation at all.

According to those who hold the theory elucidated above, rachitis is due to a deficiency of calcium within the organism; this deficiency, they assume, arises, not because of a lack of calcium in the food, but because the calcium therein contained is not absorbed. Now Rüdel's experiments prove conclusively that even in the severest forms of rachitis, soluble calcium is absorbed in the same proportion as in health; so that as Zweifel contends the root of the trouble must lie in the insolubility of the calcium salts contained in the food. Hence if this contention is to hold, rachitis cannot supervene so long as the organ has a sufficient amount of calcium at its disposal.

I have been fortunate enough to be enabled to put this contention to such a test. I have had under my observation three infants of about the same age (12, 12½ and 13 weeks respectively), whose mothers were either compelled or for other reasons decided to take their infants from the breast. Two of these infants were perfectly normal, the other had symptoms of insufficient nourishment. These three infants were then fed upon condensed milk, a teaspoonful of milk to twelve of water, which later was reduced to ten teaspoonfuls. Besides this food, there were given soluble calcium phosphate, the monobasic calcium phosphate and sodium chloride; this was given in the form of a mixture.

℞ Monobas. calc phosphate
Nat. chloride, aa.................... 3.0 (gr. 45)
Syr. simple
Aquæ, aa.........................30.0 (1 ounce)

to be administered three times a day one-half hour before feeding, that is, upon an empty stomach. Thus these infants were receiving an excess of soluble calcium and in addition, sodium chloride, to increase the hydrochloric acid in the gastric juice, so that (if Zweifel's view is correct) an additional amount became soluble from the calcium contained in the food. Now mark the result.

These infants were kept under observation for about one and a half years. At first all three did fairly well, they gained in weight, took the food readily, had no signs of gastro-intestinal disturbance, and apparently were perfectly comfortable. During the middle of the fifth month, however, two of the children began to show signs of illness. They cried more than usual, showed a disinclination to being handled, and were constipated. By the middle of the sixth month, both children had begun to sweat and bore the head into the pillow, and by the middle of the seventh month both had pronounced signs of rachitis, *i. e.*, enlarged epiphyses, prominent abdomen, bearing of the ribs, suggestion of Harrison's groove, etc. It seems remarkable, but nevertheless true, that the third infant, the one who at the beginning showed signs of insufficient nourishment, was at the time the condensed milk was discontinued, perfectly well, showing absolutely no signs of rachitis.

Early in the eighth month, the condensed milk, and at the same time, the administration of monocalcic phosphate and sodium chloride were discontinued and the children were placed upon a diet of cow's milk in the proportion of three-quarters milk to one-quarter water. This mixture received no other addition, was sterilized (?) by simply allowing it to boil up once over the free fire—allowed to cool and placed upon ice until required for use, when the quantity to be used was warmed. Upon this diet, which was soon augmented by eggs and cereals, the rachitic infants immediately began to improve; they gained in weight, cried less and less and the symptoms and signs of rachitis gradually disappeared.

I think there can be no doubt at all that these observations are conclusive. Here we have two infants, with an abundance of soluble calcium at their disposal; not alone at their disposal but ingested in such a manner as to render it impossible for non-absorption to take place, if absorption ever takes place at all. Nevertheless these infants became rachitic. And what shows still more clearly how small a part the soluble calcium ingested with the food plays in the production of rachitis, the cessation of all the extra ingestion had absolutely no influence in retarding the recovery from rachitis, so soon as the infants were given a more suitable food. More conclusive evidence against the theory that the calcium itself or the NaCl indirectly, are concerned in the production of rachitis could not be desired.

Nevertheless, for fear that these observations may be considered too few to be of value, I have adduced further evidence to support this contention. If, again, we assume that the calcium deficiency is the cause of rachitis, we must conclude that, other things being equal, the rachitis must disappear as soon as the calcium deficiency is compensated. With a view of testing this conclusion, I have tabulated the results of various forms of treatment in rachitis, including that of the administration of soluble calcium phosphate.

I have records of 803 cases, of which 203 were seen only once or twice, and are therefore not available for our purpose; 123 are not considered here, for reasons which I shall speak of in another paper. Of the remainder 150 were seen prior to 1901 and were treated according to Kassowitz with phosphorus; 50 (seen during the winter and over six months old) were given cod-liver oil; 150 were given monobasic calcium phosphate, in the manner described above; and 127 received no medication whatsoever.

All the children were, so far as is possible in polyclinical practice, placed upon a uniform diet. A number of the mothers, the most ignorant and careless, probably did not follow instructions, but the majority of them were, I believe, conscientious and any lack of favorable results in the treatment must be ascribed to other causes. Infants over three months (there were none younger) were given three-quarters milk and one-quarter water, to which was added sugar of milk in the majority of cases, and treated in the manner above described. If three-quarters milk caused gastric disturbance the quantity was reduced for a time, but soon gradually increased again. The period of observation always exceeded one month.

It takes only a cursory glance at the tables to convince any one that there is a remarkable uniformity in the results of treatment. The percentage of improvements varies only slightly with the various forms, being slightly higher without medication, and lowest with the administration of phosphorus. That the calcium phosphate has no greater curative influence than other therapeutic measures is evident from the fact that improvement was no more frequent when it was administered than when nothing at all was given.

These practical observations, therefore, bear out the theoretical consideration. The latter lead us to believe that the organism is not dependent upon the soluble calcium, in fact, the physiological consideration shows that it receives it almost entirely in the form of an organic compound with albumin. However, even should the absorption of the calcium be dependent upon its solubility, there is no reason to believe that the infant is unable to secrete sufficient HCl to bring it into solution. The former (*i.e.*, the practical observations), show conclusively that infants can, and do, become rachitic in spite of an abundant supply of absorbable calcium, and that children with rachitis are not cured any more rapidly when an excess of absorbable calcium and sodium chloride is supplied them, than when these are omitted.

We must, for these reasons, conclude that a deficiency in the quantity or a faulty absorption of the calcium ingested is not the cause of rachitis. Such being the case, and our only clue to the etiology of rachitis being the faulty deposition of the lime salts in the bones, the assumption (mentioned first at the beginning of our discussion) that an anomaly of the metabolism, which besides causing other abnormalities, is inimical to the normal calcification of the bones, must form the starting point of our search for the cause of rachitis.

TREATED WITH MONOCALCIC PHOSPHATES.

Age	No. Cases	Improved	Not Improved	
3 to 4 mos.	4	4	0	Children whose previous food was condensed milk.
4 to 6 mos.	6	5	1	
3 to 4 mos.	10	10		
4 to 6 mos.	52	45	7	Children whose previous food was cow's milk or artificial food.
6 to 8 mos.	40	33	7	
Over 8 mos.	36	25	11	
Over 1 yr.	2	2		Children whose previous food was human milk.
	150	124	26	

Per cent. not improved, 18.8.

TREATED WITH COD LIVER OIL.

Age	No. Cases	Improved	Not Improved	
4	1	1		Children whose previous food was condensed milk.
7	1	1		
3 to 4 mos.	12	11	1	
4 to 6 mos.	10	7	3	Children whose previous food was cow's milk.
6 to 8 mos.	5	4	1	
Over 8 mos.	8	6	2	
3 to 4 mos.	3	3		
4 to 6 mos.	5	4	1	Children whose previous food was proprietary food.
Over 6 mos.	5	4	1	
	50	41	9	

Per cent. not improved, 18.

CHILDREN TREATED WITH PHOSPHOROUS.

Age	No. Cases	Improved	Not Improved	
3 to 4 mos.	20	18	2	
6 to 8 mos. or more	60	47	13	Children whose previous diet was cow's milk or proprietary food.
4 to 6 mos.	44	34	10	
3 to 4 mos.	2	2		
4 to 6 mos.	8	7	1	
6 to 8 mos.	11	9	2	Children whose previous diet was condensed milk.
Over 9 mos.	5	4	1	
	150	121	29	

Per cent. not improved, 19.

CHILDREN WITHOUT MEDICATION.

Age	No. Cases	Improved	Not Improved	
3 to 4 mos.	2	2		Children whose previous diet was condensed milk.
4 to 6 mos.	1	1		
6 to 8 mos.	4	3	1	
3 to 4 mos.	19	17	2	Children whose previous diet was cow's milk or proprietary food.
4 to 6 mos.	30	25	5	
8 to 12 mos.	32	25	7	
6 to 8 mos.	34	29	5	
Over 12 mos.	1	0	1	
Over 12 mos.	4	3	1	Children who were breast-fed.
	127	105	22	

Per cent. not improved, 17.3.

How such an anomaly is induced is difficult of explanation. Moreover, it will remain difficult or impossible to explain until we have a better understanding of the nature of the anomaly than we have at present, *i. e.*, until we have a more definite knowledge of the pathogenesis of rachitis. In this rsepect we are, as Vierordt aptly remarks, still completely in the dark.

My original intention was to take up this portion of the subject this evening. I flatter myself that some of my observations are likely to throw some light upon this mystery. However, the time allotted does not permit of this, and I must therefore reserve the exposition of this part for a future paper.

PEDIATRICS

VOL. XVI. MARCH, 1904 No. 3

ORIGINAL ARTICLES

THE RELATION OF PROTEIDS TO EDEMA IN MARANTIC CHILDREN; WITH URINALYSES IN INFANTILE CHILDREN.*[1]

BY PALMER A. POTTER, B. S., M. D.,

OF EAST ORANGE, N. J.

MEMBER ALUMNI SOCIETY, NEW YORK CITY HOSPITAL, ALUMNI NURSERY AND CHILD'S HOSPITAL, MEMBER ESSEX COUNTY MEDICAL SOCIETY.

In an article entitled "A Study of 555 Cases of Summer Diarrhea," by C. G. Kerley, read before the American Pediatric Society in 1901 and published in the *Archives of Pediatrics*, the statement is made that brandy and whisky should not be used as stimulants because of the frequent involvement of the kidney in diarrheas of that character, and the consequent danger of provoking that common complication by the use of alcohol. At the time the paper was read there seemed to be a difference of opinion as to whether the kidneys were involved; and to settle this point to his own satisfaction, as far as is possible clinically, the writer, while House Physician at the Nursery and Child's Hospital, examined the urine of a number of children with acute fermentative or infectious diarrheas.

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*Read before the meeting of the Alumni Society of the New York City Hospital, October 14, 1903.

[1] Courtesy of *Medical News.*

Cases were chosen for examination that came under one of the four following heads—and then only when the urine could be collected during the height of the attack: (1) Cases with marked diarrhea, high temperature, great prostration and blood or mucus in the stools. (2) Cases in whose stools the *Bacillus dysenteriæ* Shiga was found. (3) Cases whose blood serum agglutinated the Shiga bacillus—this test rests upon the authority of Dr. W. H. Park, of the New York Board of Health. (4) Cases marked by edema of some part of the body, with or without the presence of a marked acute diarrhea.

The idea in taking the acute cases was to avoid mistaking degenerative changes in the kidney, consequent upon the long wasting illness, for acute inflammatory processes due to the diarrhea itself. The second and third classes, viz., those in whose stools was found the Shiga bacillus or whose blood serum agglutinated those bacilli, were chosen because the specific infectious nature of the disease was considered proved and not purely dependent upon errors of diet. Although Dr. Joseph Winters, in the *Medical Record,* of March 7. 1903, considers the original bacterial influence as nil and errors of diet the entire cause, both predisposing and exciting, in all cases of infantile diarrhea. Special emphasis is laid upon the cases marked by edema, most of them occurring during an attack of diarrhea, because of the comparative rarity of this condition, the different theories of its etiology, and the absence of any regular and previously efficacious treatment.

In the first class of cases the results of but twelve urine examinations are given. The number is limited because the cases were confined strictly to the very severe ones—those with intestinal toxemia—and because of the difficulty of collecting the specimen, particularly in the female babies, before the usual treatment improved the condition. When the urine could not be collected until the condition had improved the case was not included in the list.

Of those 12 cases but one, Willie F., eight months old, showed any albumin in the urine and then only a slight trace The child had a diarrhea for two days and at the time the specimen was obtained had a temperature of 104.4° F. Indican was found in the urine of but two.

Hyaline casts were found in two other specimens, both children being under four months old, at which age, little, if any, significance, can be attached to their presence.

In the second and third classes, in which the specific bacterial origin of the disease is considered settled, were four cases. The blood serum of two of these agglutinated the Shiga bacillus, taken from a pure culture, and in the other two the bacillus was found in the stools. The latter fact rests upon the authority of Dr. Steele, of New Haven. In none of these cases of proved specific infection was any trace of albumin, or other evidence of inflammatory kidney process found.

The cases with edema are taken up in detail because this condition is rarely met with, and when it is, usually ascribed to cardiac or renal disease, although apparently independent of either. The writer is able to find it mentioned in but one of the standard text books of pediatrics.

As dropsy in the legs frequently accompanies heart lesions, and in other parts of the body accompanies heart or kidney lesions, the presence of edema in infants naturally leads to the belief that one of these organs is involved. Clinical evidence, however, would appear to show that this is not necessarily the case.

Edema in marantic infants during an attack of diarrhea, differs from the dropsy often seen toward the end of a long, wasting illness, such as pulmonary tuberculosis or carcinoma, in that it is not necessarily an ante-mortem sign. Of the six cases mentioned in this paper, five recovered. The individual cases were as follows:

Case I.—Six months old, weight 6½ pounds, vomiting, refusal of food, fever, frequent defecations of curds and mucus. Temperature 104° F. Barley water was substituted for milk and the usual medical treatment instituted. In the next twenty-four hours the edema began in soles of feet, a slight reddening of the skin being the first thing noticed. In twenty-four hours the eyelids were puffy, in the next twenty-four the whole face became so swollen that the eys could not be opened and the legs were also much swollen, with deep pitting on pressure over the tibia. While impossible to collect the total urine for measurement it appeared to be slightly less than usual. The results of the examination of the specimens collected were negative, the sp. gr. being 1.014, with no casts, no albumin, no indican, The hemoglobin was 70 per cent., the leucocytes 8,500 and the clotting of the blood apparently normal.

During the increase of the edema the regular treatment, dietic and medical, for the pre-existing diarrhea, was carried out. At the same time systematic treatment for the edema was instituted, as recommended in the only text book containing any information on the subject. Heat over the kidneys, diuretics, as spiritis etheris nitrosi, citrate of potash and fl. extract of digitalis, were all used, but with no decrease in the edema, nor improvement in the general condition. Finally all medication was stopped. The food, which during the worst part of the diarrhea, had been plain barley water and which now contained by the addition of 4 per cent. milk, 75 per cent. of fats and proteids, was abruptly changed to a mixture containing 2½ per cent. of proteids and fats and in sixteen hours the edema had entirely disappeared. The general condition improved from that time, and continued to do so, although the food had to be carefully regulated.

Case II.—Age ten months, weight 8 pounds. This was a typical marasmus case, as will be seen from the age and weight. Brought in for bad, frequent bowel movements. On first examination soles of feet were slightly swollen. Twelve hours after admission eyes were puffed up and the child gained seven ounces in two and a half days. The regular, generally acknowledged treatment for the existing diarrhea would have been withdrawal of all milk, to avoid forming new culture grounds for the bacteria. The presence of the general edema was so ominous, however, and the child's general condition so bad, that, from the lesson of the previous case, the amount of proteids in the food was rapidly increased, with entire subsidence of the dropsy and a loss of 10 ounces in weight. The general condition rapidly improved under the increased proteids, although the stools continued somewhat frequent and curdy. The urine in this case during the height of the edema was voided but once in sixteen hours, and showed no indican, but did have a slight trace of albumin and a few hyaline casts. The hemoglobin was about 45 per cent. and coagulation apparently not retarded, leucocytes about 10,000, the proportions of the various kinds being about as usual.

Case III.—Ernest H., aged ten months, weight 9 pounds 8 ounces. This case had been in the hospital for several weeks with malnutrition, when the edema began. He was being fed on a mixture of 4 per cent. milk and barley water, in which the fats and proteids approximated 1½ per cent., the sugars six. On Sept. 27, his eyelids and feet began to swell, he gained rapidly in weight and many casein curds appeared in the movements, although the bowels continued regular. The proteids were lowered to one per cent., then raised to two per cent., and the milk peptonized. The edema disappeared and 11 ounces were lost in twenty-four hours. The urine and blood examinations were absolutely negative, the hemoglobin being 65 per cent. At the time of writing this child weighs sixteen pounds and is perfectly normal and healthy.

Case IV.—Stella S., aged three months, weight 7½ pounds. Was being fed on a mixture of 4 per cent. milk and Imp. Granum, 1½ ounces of milk to 3 ounces of Imp. Granum, a mixture in which the fats and proteids approximated 1 1-3 per cent., the carbohydrates being high. On Oct. 17, almost a month after the appearance of any other case of edema, the temperature fell to 96° F., feet and then eyelids began to swell and six ounces were gained inside of twenty-four hours. Food was changed to a milk and whey mixture and the proteids increased to 2 per cent., then to 2½ per cent. and edema disappeared entirely in thirty-one hours. The bowels were disturbed in consequence of the increased strength of the food, but as the general condition improved and temperature rose to normal the formula was retained for one week. The urine in this case showed no albumin, no indican, a few hyaline casts, and there was no suppression. This child died seventeen days later of laryngeal diphtheria, twelve hours after intubation.

Case V.—Annie H., aged ten months, weight eight pounds eight ounces. Edema began on Oct. 25 (during an attack of diarrhea) and progressed as in the other cases. The child voided urine but once in the first thirty-six hours after the edema began, and averaged in the next five days during which the edema lasted only four ounces in twenty-four hours. To contrast results the previously accepted treatment was adopted. Diuretics were given as in Case I, as well as the usual dietetic treatment for diarrhea, but edema persisted, although the condition of the bowels improved. On Oct. 29, after dropsy had lasted four days, this treatment was abandoned and a milk and whey mixture given, and the fats and proteids rapidly increased to about 2 per cent., in addition to the lactalbumen in the whey. In thirty-one hours the edema had entirely disappeared and the general condition improved rapidly. The urine examination was negative in this case, as was the blood, the hemoglobin being 60 per cent.

Case VI.—Aged 3½ months, weight 6 pounds 2 ounces. A case of marasmus. Was put on a milk-whey mixture after coming in the hospital. On Nov. 6, 1902, bowels became bad, and child was fed on plain whey. On Nov. 17 edema began in the feet and progressed in the usual way but very rapidly, until the entire body, with the exception of the serous cavities, was much swollen. Urination apparently about as usual in frequency and amount. Weight increased eight ounces in three days. The bowels remaining bad, the child was still fed on whey, but two days after the onset of the edema, because of its rapid spread and in spite of the condition of the bowels, milk was added and rapidly increased with every feeding, until the proteids reached 2 per cent. plus the proteids of the whey. The edema decreased almost immediately and had entirely disappeared in two days. The urine showed no casts, and no albumin. The leucocytes were about 12,000 and the hemoglobin less than 40 per cent.

Case VII.—An Italian child, 4½ months old. Weight 4½ pounds. In this case diarrhea had existed five days before admission. The child had been fed on Russian tea and brandy and was in very bad shape. Within twelve hours after admission began to show edema. A combination of milk and whey, with the milk rapidly increased, was given, but not retained. After plain whey for six hours, during which the edema increased, small, repeated doses of milk and whey were finally retained. The edema entirely disappeared in 2½ days under increased strength of the formula. The urine was entirely negative, not even hyaline casts being found. The polymorphonuclears outnumbered the lymphocytes. The hemoglobin was 50 per cent. The edema did not return and the child went out eighteen days later with a gain of eleven ounces and conditions much improved.

The heart sounds in all these cases were perfectly normal. Several theories have been advanced as to the cause of edema of this description. Dr. L. Emmett Holt thinks it due to the hydremia of the blood in the cases he has observed. Remlingen, in the *Revue de Médecine* of October, 1901, speaking of a few cases of edema without albuminuria observed in adults after severe or protracted attacks of diarrhea, ascribes the same cause. Dr. Rowland G. Freeman, from the cases observed at the Nursery and Child's Hospital, and at the New York Foundling Asylum, thinks it is of infectious origin. De Wolf, of Providence (*Archives of Pediatrics,* Dec., 1902), in describing an apparent epidemic of edema accompanying diarrhea in infants, considers it of renal origin dependent upon infection, presumably through the milk.

Of the cases here noted but two seemed to have any etiological relation. Cases II and III showed edema on the same day and were in adjoining beds in the same wards. All the others showed the condition at widely different periods and locations. The cases showing edema on admission to the hospital, entered after it had appeared in children already there, so could not have brought in the infection from the outside. As to the possible nephritic origin without albuminuria or other clinical evidence, the necropsy records for the past several years of Dr. Vanderpoel Adriance, pathologist of the Nursery and Child's Hospital, show that none of the cases with edema had any kidney lesions. L. Emmett Holt, in 70 autopsies on gastro-intestinal cases found but one affected kidney.

Dr. C. A. Herter—whom the writer is unable to quote verbatim, but from memory only—thinks the edema due to involvement of the sympathetic nervous system from severe constitutional depression. This view is certainly supported in the cases here presented by the improvement in the edema and also in the general condition, under an increase in the proteids in the diet. The usual dietetic treatment for diarrhea is of course the withdrawal of the proteid element in the food, but in cases marked by edema in marantic children the constitutional resistance appears to be so slight that the proteids need to be retained and even increased notwithstanding the locally irritant effect on the intestines. It appears to be a choice between aiding the general system and making the diarrhea worse—or rather not treating it after the generally accepted method—and improving the diarrhea with probably fatal consequences.

The recovery of the severe cases with the supposedly ante-mortem sign seems to warrant this statement.

To sum up: (1) Acute diarrheas—not protracted cases—are not accompanied by kidney involvement; (2) alcohol is not, some existing refractive error. In cases of unequal refraction of the two eyes the patient will put all his efforts at seeing in the one eye, permitting the other to become convergent. Thus it is that strabismus is seen to follow measles occasionally. It is manifest that the cure is the prompt use of properly fitted glasses to correct the strain and equalize the dynamic forces.

Deep and grave ocular lesions have been reported complicating measles, such as blindness due to optic neuritis and meningitis. Von Graefe regards the blindness to be due to acute retro-bulbar optic neuritis—that is, an interstitial inflammation of that part of the optic nerve which lies between the eyeball and the optic foramen. Occasionally abscess formation of the orbit or eyelids occurs, due to the lodgment of a septic embolus.

Ear, Nose and Throat Complications in Measles.—A dark red discoloration of the mucous membrane of the pharynx, faucial pillars and tonsils is what we are all familiar with as one of the prodromal signs of measles. Sometimes the discoloration is noticed on the lining of the lips and cheeks (Koplic's sign). A measley eruption and slight membrane can frequently be seen on the tonsils and adjacent structures, indicating epithelial necrosis. Tobeitz noticed similar appearance in the larynx, accompanied by cough and hoarseness, due to these shallow ulcers and erosions, but croupous laryngitis is rare in measles.

The aural complications have been carefully studied by noted foreign authorities. Bezold and others examined the ears of sixty-three children who had died of measles, many of whom gave no ear symptoms during life. Bezold states the middle ear is congested early in this disease. There is diffuse injection, with more or less muco-purulent, sero-purulent or purulent inflammation present in the middle ears, mastoid cells and mastoid antrum. Also erosions of mucous membrane and patches of false membrane, but the swelling was not great and no bone was exposed.

Acute purulent otitis media with perforation, as we all know, is quite common in measles, but the otitis usually subsides and the hearing is usually restored. It is claimed, however, that 4 per cent. of deaf-mutism is traceable to measles. It is believed by some that the ears are infected from the throat via the tubes, but since the eruption in the middle ear is so like that seen in the throat we are led to the inference that the ear disease is measles *per se.* All sorts of pathologic germs are found in the pus discharged from the auditory canals, so that the process is a study in mixed infection.

SCARLATINA.

The Ocular Complications.—Story, in "Norris and Oliver," states: "The principal ocular lesions in scarlet fever are catarrhal conjunctivitis and amaurosis." The conjunctivitis is very similar to that seen in measles, and need not be dwelt upon. The amaurosis appears during the latter part of the stage of desquamation, and is usually due to the acute Bright's incited by the disease. There are many cases of sudden and complete blindness coming on after convulsive seizures and stupor reported, and in each case albumin was found in the urine. The albuminuria precedes the blindness a week or ten days. The sight slowly returns and the recovery is usually complete. It takes about three weeks for the sight to be restored. Cases of transitory blindness lasting twenty-four hours complicating dropsy and hemiplegia are reported. In all these cases of blindness the ophthalmoscopic examination was negative. Other cerebral symptoms besides amaurosis are headache, convulsions, vomiting, stupor, paralysis, etc. Förster states: "There can be no doubt that these cases must be classed as uremic." Careful tab should therefore be kept on the quantity of urine passed every twenty-four hours, and a test for albumin frequently made by the attending physician, who is on the *qui vive* for this alarming crisis.

Albuminuric retinitis is sometimes seen after a siege of scarlet fever, but it is more the evidence of chronic Bright's than of an acute parenchymatous nephritis. In this disease there is gradual but perhaps partial loss of vision, due to the atrophy which follows.

Other complications which have been seen in scarlatina are embolism of central artery of retina, lagophthalmos and complete sloughing of the cornea, suppurative choroiditis due to septic emboli (Fuchs), septic thrombosis of cavernous sinus, and edema of the orbital tissues and eyelids. Max Knies, in his admirable work on "The Eye in General Diseases," refers also to blindness due to uremic poisoning, albuminuric neuro-retinitis, meningitis producing optic neuritis, spasms and ocular paralyses.

Phlyctenular keratitis and conjunctivitis, also suppurative otitis, are, he states, more frequent in scarlet fever than in measles. Abscess formation in and around the eye is not infrequently due to septic embolus. The tear gland is sometimes the seat of intense inflammation and abscess formation. All in all, we find pretty much the same complications as in measles, only that, inasmuch as scarlet fever is more pyogenic, so to speak, the ocular complications are more intense and more serious.

Ear, Nose and Throat Complications in Scarlatina.—Freidreich states: "The principal complications in the upper air-passages are catarrhal angina and a form of diphtheria." The angina usually precedes the eruption. The throat takes on a "deep red violaceous" color, with dryness, tickling and a desire to swallow. Freidreich also states: "In a large percentage of cases streptococcic infection occurs and the result is diphtheroid scarlatina—a necrotic inflammation of the mucous membrane, presenting the anatomic picture of diphtheria, but minus the Klebs-Loeffler bacillus and the paralytic symptoms." Heubner, in 1888, published the results of his careful observations, and since then this diphtheroid scarlatina or scarlatinal diphtheria has been better understood, and the confusion confounding the two diseases no longer exists to such an extent as before. The infection is streptococcic, not diphtheritic. He notes three clinical forms: (1) a "mild form," slight superficial necrosis limited to the fauces, with no bleeding on removing the false membrane, but usually passing into a (2) "subacute form"; the temperature shoots up on the fourth or fifth day, the glands enlarge, a yellowish exudate appears on the tonsils, pillars and wall of pharynx, thence to post-nasal space and nasal cavities and also down in the larynx; there is "ulceration and tissue destruction," varying in form and extent, purulent rhinitis and all, differing in no particular from the picture of true diphtheria; but laryngeal stenosis is rare, because the false membrane is soft and less adherent, although edema of larnyx and asphyxia have been observed; and (3) a "malignant form," which presents the picture of intense general septicemia, with rapid destruction of the mucous membrane of the nose and throat and necrosis of the cervical and parotid glands, terminating fatally in seven to ten days. None of the post-diphtheritic palsies were seen to occur in 600 cases. It must be remembered that true diphtheria does occasionally complicate scarlatina, and when so the Klebs-Loeffler germ is found and there is invariably a sequel of paralysis.

Acute otitis media purulenta is a very common complication in scarlet fever. Usually the drum membrane ruptures early and there is profuse otorrhea. The disease is more violent in all its manifestations than measles otitis, and there is far greater tendency to bone necrosis, mastoid involvement, with acute abscess formation, and oftentimes even grave symptoms indicating that an abscess has found vent into the cranial cavity, either as extradural abscess or an abscess of the brain itself. The general septicemia is frequently profound, and we have every reason to fear a fatal termination. In cases which recover we find extensive destruction of the drum membrane, with more or less permanent impairment of hearing. Bezold states that 25 per cent. of cases have total destruction of the membrana tympani, and that 19 per cent. of the deaf-mutes owe their affliction to this disease. It is manifest that if serum therapy is to be used, not the diphtheria antitoxin, but the antistreptococcus serum, is proper. Unfortunately, the latter is not so specific a remedy for septicemia as is antitoxin for diphtheria.

DIPHTHERIA.

The Ocular Complications.—The most frequent ocular complication of diphtheria is paralysis of accommodation. This, however, is not so much a complication as a sequel, for it does not manifest itself usually till after the fever and other diphtheritic symptoms have disappeared. It is a curious fact that the ciliary muscle is, next to the velum palati, most often the seat of paralysis, and it is also a curious fact that the pupil is usually not affected. The accommodation paralysis is nearly always a bilateral affair, although now and then a monocular ciliary paralysis is seen. The affection is slow in appearing and slower still in departing, but complete recovery usually takes place in the course of time, with or without treatment, and it is therefore one of the affections which yields the physician a glory which he does not deserve. The severity of the diphtheritic disease is no criterion to judge the appearance of paralysis of accommodation, for the condition is as apt to appear after a mild attack as a severe one. This aids us in declaring that a doubtful case of sore throat was really diphtheria, for paralysis appears, so far as I have been able to observe, only after a real diphtheritic infection. The vision will remain normal for distance provided there is no refractive error present, and the ophthalmoscopic examination is usually entirely negative. Eserine stimulates contraction of the ciliary muscle and a weak solution (one-half grain to the ounce) should occasionally be instilled in the eyes, merely to prevent atrophy of the muscle fibres and perhaps hasten the cure, but too much eserine is worse than not enough, for we must remember the tendency that eserine has to produce iritis.

Other ocular paralyses besides the above mentioned have been frequently observed, *e. g.*, third nerve palsy, causing ptosis and divergent strabismus;; paralysis of sensory nerves has also been noted, causing neuroparalytic ulceration of the cornea. I once saw a case of complete white necrosis of both corneæ in diphtheria where *not a sign of redness of eyes was present*—so-called "keratomalacia." The child was entirely blind, of course, but fortunately succumbed to the poison of the diphtheria. Just what the toxic agent is which causes paralysis, or where located, whether in the nucleus, the trunk of the nerve or the nerve ending, is a mooted question. Kneis states: "In most cases we have to deal with a hemorrhage or neuritis, or with hemorrhagic neuritis." He also states that a "definite ptomaine is produced which has a paralytic action on the accommodation but no effect on the pupil?"

Rarer ophthalmic lesions are optic neuritis associated with renal disease; anesthesia of the retina, producing contracted fields of vision; abscess of the orbit, due to septic embolus and tear-gland suppuration.

In the articles from which I have quoted nothing much is said of diphtheritic conjunctivitis. I have seen several cases of this disease, and it is to be dreaded. Aside from the great danger of complete loss of the cornea, there is some danger to life itself. Let me briefly report a case:

J. R., aged thirty-two, a healthy, active and useful citizen, contracted diphtheria of the eyes in 1901. No systemic involvement. Antitoxin was used and constant nursing instituted, with recovery, leaving only a mass of linear scars of the conjunctiva to show that the disease had existed. A year later he returned to my office, stating that he had diphtheria of the eyes again. He had normal temperature, was feeling well physically, and merely had a slight conjunctivitis, but on the following day there was a false membrane covering the palpebral conjunctiva, and examination with the microscope revealed the bacilli of diphtheria in abundance. He was put in the hospital at once, and similar treatment to what he had had a year before instituted, but infection of the lining of the lips, cheeks, tonsils, pharynx, esophagus, larynx, intestines, kidneys, and even purulent endocarditis occurred, and he died after about two weeks' illness. Antitoxin freely used—and early, too—had no effect whatever. The eyeballs were covered with diphtheritic membrane. The post-mortem, conducted by Dr. Joseph Eichberg, showed evidences of diphtheritic membrane and streptococcic infection everywhere where there was mucous membrane.

Ear, Nose and Throat Complications in Diphtheria.—The levator palati muscles are most frequently paralyzed, causing dysphagia, regurgitation of fluids through the nose, and nasal speech. Sometimes the vocal cords, one or both, are paralyzed. If anesthesia of pharynx and larynx is present there is some danger of "inspiration pneumonia."

Ear complications are not very frequent. Occasionally an acute inflammation of the middle ear starts up, but we do not meet with as many, nor usually as grave, cases in diphtheria as in scarlet fever or measles. Casts have been noticed in the middle ear seen through a perforation of the drum membrane, and a few cases of complete cast of the auditory canal have been reported where otitis externa or eczema auris preëxisted. The anatomic investigations of Lommell and Wendt are interesting. They found in nearly all cases of diphtheria in the dead-room that the middle ear invariably contained mucus, serum and pus, and even where no symptoms were complained of while living. Lommell found pus in 50 per cent. of his post-mortems, and states that diagnosis from the drum-head in life would have been impossible. He found but one case of normal ears in diphtheritic cadavers, and hence states that "otitis media forms an integral part of the clinical picture of diphtheria." The same investigator found the Eustachian tubes singularly free from diphtheria exudate, and so leads us to believe that the middle-ear disease is an expression of the general infection. Nerve deafness has been reported following diphtheria, but is, fortunately, rare.

There is one point regarding diphtheritic infection which I feel is appropriate to this discussion. I have seen three cases of surgical wounds, two of the mastoid and one of the tonsils, where diphtheritic infection accidentally occurred. In all cases there was a decidedly diphtheritic-looking membrane that completely sodded the granulating wound, and the Klebs-Loeffler bacillus was found abundantly present in each case. These patients all felt perfectly well. There was no post-diphtheritic paralysis and no cachexia.

WHOOPING-COUGH.

The Ocular Complications.—Aside from the slight conjunctivitis seen in pertussis and occasionally a storm of phylctenules, this more or less insignificant disease has some curious and even very serious ocular complications. We have all noticed subconjunctival hemorrhages, and are led to make a positive diagnosis when these deep red splotches of blood appear under the transparent conjunctiva. Sometimes hemorrhage takes place in the brain, producing hemianopsia, and, if on the rear cortex of both hemispheres of the brain, total blindness. In such cases the pupils act to accommodative effort and the ophthalmoscopic examination is negative. Uremic amaurosis has also been reported in this disease. Meningitis is not a rare complication, and optic neuritis followed by atrophy has been observed. There may be retrobulbar neuritis and hemorrhage in the optic nerve. Knapp has seen ischemia of the retina, white optic nerves and narrow vessels similar to that seen in quinine blindness. Loomis states that the cases of blindness usually die of pneumonia. Jacoby notices mydriasis, double optic neuritis and blindness. One authority saw a hemorrhage of the optic disk with obliterated retinal artery.

Dislocated lens has been known to occur, due to the violent cough. Paralysis of one or more of the ocular muscles has been recorded, and is thought to be due to hemorrhage of the nucleus. Whooping-cough has been given as a cause of strabismus. Otitis media purulenta may complicate pertussis.

MUMPS.

The Ocular Complications.—To quote from Kneis, "Mumps sometimes caused conjunctivitis, epiphora, edema of eyelids, chemosis of conjunctiva, and occasionally enlargement of the lachrymal gland." Dacryoadenitis has been reported by a number of noted authorities. Hirschberg reports cases where the inflammation was expressed in the lachymal glands *without any evidence of the parotids being involved*—a sort of "lachrymal mumps." Tolon reports optic neuritis, post-neuritic atrophy and blindness. Metastatic irido-cyclitis necessitating enucleation is spoken of. Paresis of accommodation, bringing to the surface any hidden refractive error, has been noticed.

Ear Complications in Mumps.—The aural complications of mumps are usually located in the labyrinth, causing "Menier's complex," and resists all treatment. But the vertigo, tinnitus and equilibrium disturbance usually disappear, leaving the ear profoundly deaf. I have seen several cases. Inspection of the membrana tympani entirely negative, Eustachian tubes and middle ear normal. Both ears may be affected, but, fortunately, this is rare—0.5 per cent. as a cause of deaf-mutism.

INFLUENZA.

The Ocular Complications.—Here we have a disease which for the variety of eye, ear, nose and throat complications seems the palm bearer. Almost every disease of the head has been reported as having occurred in connection with grippe. The gist of it all seems to be that any latent disease which lurks about the cranium awaiting an exciting cause finds in grippe a boon companion. There seem to be two types of complications:

1. *The Nervous.*—The purely nervous grippe affections of the eyes are, briefly, neuralgias affecting one or more branches of the trigeminus, sometimes accompanied by herpetic eruptions on eyeball, eyelids, brow, etc.; phlyctenular keratitis and conjunctivitis; neuropathic keratitis, due to inhibition of nutrition, with corneal anesthesia and outside infection, painful points about brow and head, ciliary neuralgias, deep-seated pain of a dull but distressing character located back of eyeballs and over frontal and maxillary sinuses, ophthalmic migraine, causing flimmer scotoma and transitory amblyopia; paralysis of one or more or all of the extrinsic ocular muscles, etc. Some of these disturbing neuralgias are undoubtedly due to the acute involvement of the accessory sinuses of the nose, viz., the frontal, ethmoidal, sphenoidal and maxillary sinuses, with or without pus formation, the pain being purely reflex in origin and not abating until the nares return to their normal state.

2. *Inflammatory Grippe Affections.*—Suppurative sinusitis is nearly always responsible for the abscess formations in the orbit, under the lachrymal sac, anywhere around the rim of the orbit

where sub-periosteal abscess occurs from extension through the thin bone separating the orbital cavities from the sinuses of the nose. The peripatetic staphylococcus and other pus-formers are the handmaidens of grippe, although specific germs have been isolated by Pfeiffer and others. The grippe infection has been known to light up an old iritis or irido-cyclitis or irido-choroiditis and has wrought havoc to the vision through the exudation which takes place in the clear media of the eye in these affections. Embolic choroiditis and panophthalmitis have been observed during an attack of influenza. Embolism of the central artery, hemorrhages in the retina and vitreous, plastic retinitis and optic neuritis have all been reported associated with grippe. Glaucoma in a patient having a perdisposition for same is apt to be incited and the attack is uncommonly severe. But none of the above affections are pathognomonic of grippe, like paralysis is of diphtheria. Perhaps the most characteristic lesion is small hemorrhages in the tissues and along the nerve strands. Recovery from grippe affections about the eye is tedious.

In 1901 I read a paper before the Western Ophthalmologic and Oto-Laryngologic Association on "Optic Neuritis from Intra-Nasal Disease," and in that paper I attempted to show that the optic neuritis was largely due to inflammation in the sphenoidal sinus, causing bulging and inflamed walls, which pressed against the outlying optic nerves at the foramen. The intense facial neuralgia and ocular paralyses were explained in the same way, for the third, fourth, fifth and sixth nerves lie close to the sphenoidal cell and very close to the optic nerve in this locality.

Ear, Nose and Throat Complications in Influenza.—In the nose and throat we have the familiar picture of acute naso-pharyngitis, with accent on the naso. The accessory sinuses of the nose are frequently affected. During the recent epidemic the Cincinnati specialists were kept busy washing out the accessory cavities, and in some cases opening them to relieve more or less severe and painful symptoms.

As regards grippe manifestations in the ear, Politzer states: "A hemorrhagic inflammation of the membrana tympani often develops in the initial stage, and accompanied by the formation of smaller or larger dark blue or black bullæ. They are situated on the posterior superior quadrant of the drum membrane, and, lasting a short time, burst before penetration of the membrane has taken place, thus discharging their hemorrhagic contents into the auditory canal." This is exactly what I have seen several times, and it demonstrates beautifully the hemorrhagic proclivities of this disease.

Obstinate otalgia often persists, sometimes even when no inflammation can be detected.

Suppurative otitis media is quite common, and there is apt to occur necrosing mastoiditis, with the variegated picture of extradural abscess, meningitis, cerebral abscess, cerebellar abscess, pyemia, perisinus abscess, thrombosis of sigmoid and cavernous sinuses, etc. (Politzer). All the ear clinics are crowded during grippe epidemics with patients suffering from otitis media—acute, subacute and chronic. Occasionally the internal ear is involved, producing deafness more or less profound, with impaired tone limit and decreased or abolished hearing for bone conduction, etc. Dizziness, vertigo and equilibrium disturbance being also present—in a word, Meniere's disease.

The eye, ear, nose and throat complications in other infectious diseases, such as are seen in smallpox, chicken-pox, typhoid fever, acute malaria, acute articular rheumatism and epidemic cerebrospinal meningitis, will, for want of time, have to be passed over with the observation that optic neuritis is not unusual in these diseases. Also iritis in rheumatism, ulcers of the cornea from pustular formation in smallpox and chicken-pox, hemorrhages in malaria and phthisis bulbi in cerebro-spinal meningitis, while acute middle-ear inflammations and involvement of the internal mechanism are not rare.

CARE OF EPILEPTICS IN PRIVATE PRACTICE*

By William N. Bullard, M. D., Boston.

While it may be laid down as a general rule that all adult persons subject to epilepsy of a serious type are better treated in institutions, whether public or private, we are nevertheless often called upon to care for epileptics who, for some reason, cannot or should not be sent away from their homes.

We are forced to treat a certain number of adult epileptics as private patients, either because the frequency of the sickness is not so great as to render them incapable of following their professions or living their ordinary life, or because they have the means to enable them to take the precautions and measures which may safely protect and guard them, and to follow out precisely and fully any form of treatment which may be deemed advisable, irrespective of trouble or cost.

There are others who should be in institutions who cannot be placed there because they will not go voluntarily, and cannot be committed as insane, or whose relatives refuse to allow them to go, under some idea of misplaced kindness. Lastly, I need scarcely refer before this Association to the fact that in many parts of the country there are no proper institutions to receive epileptics, and *therefore* they must be cared for elsewhere as best they can.

If we are called upon to treat an adult epileptic in private practice, what is the best form of treatment? Can we lay down any general rules which may serve to guide us in this matter?

In general, it may be said at the beginning that there is only one form of drug which can be relied upon as of real use in almost every case, and that is certain bromide salts. I will discuss farther on the indications generally appropriate for these cases, and will only say now that I believe that medication alone plays only a part in their proper treatment.

In general treatment, most important is the suitable regulation of the life. The exact details of this depend in each case upon the special conditions, the frequency and severity of the attacks, and the intermediate state.

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*Read before the National Association for the Study of Epilepsy, Nov. 5, 1903.

In the least severe cases where there is little or no mental impairment, and where the attacks are not too frequent, if the patient be not very young and the condition has existed, essentially unchanged, for some time, or with but slight advance, it may be advisable that the ordinary life should be led and the profession or regular occupation should not be changed, but under these circumstances the amount of brain work must be carefully regulated so as to avoid all sudden mental exertion or strain, and as far as possible any excess of worry or anxiety. It is, on the whole, better for the adult epileptic who has long been subject to attacks, occurring not more frequently than once in two or three months, and who has reached the age when definite mental habits have been formed, to continue to employ himself with his former occupation or work. The sudden breaking up of the form of life in these cases is not advisable.

In the young, or those who have not been long engaged in any special form of work, we should naturally advise that form of life which brings the least mental exertion while affording sufficient regular occupation, and at the same time affords a considerable amount of physical exercise. This is usually farming or some outdoor occupation of a similar kind. The chief requisites are regular occupation, no mental strain, fresh air, and moderate physical exercise. In the more severe cases, even in those who have long been engaged in a special form of work, it is sometimes advisable that their profession should be abandoned, and an entire change made in their mode of life, but this can rarely be done with benefit unless some other regular occupation or interest can be substituted. The mind of the patient must not be fixed upon his physical condition, and his body must not be allowed to fall into a vicious routine.

Digestive Functions.—Much can be done for the epileptic, especially in the most severe cases, by the regulation of his digestive apparatus. In all cases it is advisable that the bowels be regularly and properly evacuated. Constipation should never be allowed to occur, and sharp measures should be taken to remedy it, if required. There has been much discussion for many years on the question of the best diet for epileptics. Some authorities have advised the omission of meat, and indeed this may be said to be the routine practice. I believe, however, that the best diet for the epileptic is, as a rule, ordinary mixed diet—the common food such as is found on the ordinary table—but there are certain rules which must be absolutely followed, and never can be infringed with impunity. The first of these is the regulation of the *quantity* of the food. This should be reduced to a moderate amount; no sense of fulness or repletion should be permitted, and it must be well chewed. It must, moreover, always be adapted to the state of the teeth. In hospital practice especially do we often find that patients have been given food which they are entirely unable to chew and hence cannot readily digest. The teeth themselves must be carefully looked after and kept in proper condition. It is on matters like this that the real treatment of the epileptic depends.

The character of the food need not be changed from that in ordinary use, provided that the patient uses special care to avoid those articles of food which he finds by experience disagree with him. In many cases patients are well aware that there are certain things which, personally, they cannot eat. Absolute avoidance of these things is necessary and must be insisted on. This often requires judgment and self-control on the part of the patient, and most watchful care and attention on the part of the medical attendant.

In very severe cases it may be necessary to limit the diet considerably, and among the forms of treatment sometimes in use we must mention the withdrawal of all table salt (NaCl) from the food, with or without the substitution of Na.Br. in its place.

The general rules in relation to the digestion are that the patient should have as varied a diet as is compatible with his digestive powers; but extreme care should be taken to avoid any disturbance of digestion or to increase its difficulty, and in order to best accomplish that it is necessary that the mastication should be good and sufficient for the food taken, that no unsuitable material should be ingested, and that free evacuation of the intestinal tract should be made daily. Perhaps more depends for the epileptic on these conditions than on any other single thing. Alcohol as a rule is to be avoided. Tobacco in ordinary amounts does not seem injurious. Tea and coffee must be limited, and their action carefully watched—there is reason to suppose that coffee is often injurious.

Sleep.—Epileptics should have all the sleep ordinarily required—that is, all they require in their normal condition between attacks—and they should not be awakened as a rule in the case of abnormal sleep which occurs after or in place of seizures. It seems advisable, however, that their sleep should occur at regular hours at night. It is not at all infrequent for patients to have attacks after sleeping in the daytime, and naps after dinner, etc., are to be avoided.

Exercise.—Moderate regular physical exercise is best; either an excess or a lack seems to be harmful, but the latter is worse than the former. Fresh air seems to be of benefit. The ordinary epileptic should lead an outdoor life.

Suitable occupation is very important, perhaps the most important item in the treatment. The occupation should be not too exacting, regular, not producing or accompanied by excessive mental strain. One of the great advantages of institutions is that they are able to supply good routine occupation. One of the great misfortunes against which the epileptic has to contend is his inability to obtain continuous work. Few people will employ epileptics, knowing them to be such, and for many situations it is neither right nor proper that they should be employed.

Regular moderate physical exercise is desirable in cases where no definite occupation is obtainable.

Freedom from mental excitement and especially from mental shock is important. How this is best to be obtained depends upon the circumstances in each special case. In this matter the wisest judgment of the physician is required and as much knowledge as is possible of the patient's family, conditions, and surroundings. Serious worry and mental anxiety are to be avoided with care, but on the whole seem less evil than might be expected; the more chronic mental conditions of this character having less obvious effect on the disease than the acute. Moderate mental application is not apparently harmful in many cases, but its effect must be watched; excessive mental work is not permissible.

Medical Treatment.—Bromine in some form seems to be the only generally efficient medicine. In individual cases certain other drugs are said to have been beneficial. As a rule, however, the bromides are our mainstay, and where bromine in some form or other does not act, other drugs have been, in my experience, of comparatively little use. **Much** wisdom is often required in regard to the dose and method of administration of the bromides. Personally, I have come to rely principally on bromide of sodium, varying it occasionally when it is necessary with bromide of potassium. Some form of the triple bromides is often used, and is sometimes effective. I have found comparatively little difficulty in giving the bromide of soda. It is, I believe, best administered before meals, and if necessary at bedtime, in a considerable amount of water—a half to one tumblerful with each dose. No unpleasant effects have been observed in ordinary doses—30 to 40 grains a day when thus given—except the acne, which is best combated with Fowler's solution. I have kept up these doses for months at a time, sometimes continuously, and sometimes with more or less frequent remissions of a week or a fortnight, without trouble and with excellent effect. That bromism may be induced by large doses of bromides is well known, but with constant watchfulness and care in changing the amount of the bromide given, in changing the form, as from the soda to the potash or the ammonium salt, and in using the proper remissions, this can be readily avoided.

Many other drugs might be mentioned which have been said to have been successful in special cases, but none of these are to be relied on. Iodide of potash should always be tried if nothing else will aid.

The omission of salt in food seems to be of distinct advantage in some cases, but this cannot be thoroughly carried out as a rule in private practice. The partial omission of salt—that is, not taking any at meals in addition to that used in the cooking—is only an inefficient and partial aid. The substitution of bromide of sodium for chloride of sodium in the food is often really of great benefit, but cannot be undertaken outside of an institution.

In conclusion I would say that while I believe the bromides are adjuvants in the amelioration and treatment of epilepsy, the most important object of our care and attention must be the regulation of the diet, exercise, sleep, and occupation of the patient—in other words, the general details of his life. In this way can the best results be obtained.

The care and attention must, however, be unremitting, and the details should devolve actually on the family physician, while the specialist lays down only the general rules to be followed. The success of the treatment will depend chiefly on the conscientious attention of the physician to details often apparently insignificant, and on the capability and will of the patient to do as directed.

THE OPEN-AIR TREATMENT OF BRONCHO-PNEUMONIA COMPLICATING WHOOPING-COUGH[1]

By CLAUDE B. KER, M.D., F.R.C.P.,

MEDICAL SUPERINTENDENT, EDINBURGH CITY HOSPITAL.

When I took over the charge of the City Hospital seven years ago, the Medical Officer of Health, Sir Henry Littlejohn, drew my attention to the very large death-rate from whooping-cough both in the city and in the hospital, expressing the hope that something might be done to reduce it. From that time I have always had this object steadily in view, and, although I have by no means attained the success that might be desired, I have at least had the satisfaction of making a considerable reduction in the death-rate of the most serious complication of this very fatal disease.

Those who only see whooping-cough in good class practice do not perhaps realize how serious it is liable to be in the children of the poor. The mortality in Edinburgh for a period of five years ending 1900 was 48 per thousand persons living, in fact, nearly one-third of the whole zymotic death-rate was caused by this disease. As the children of the better classes rarely succumb to whooping-cough, this means that the slum population suffers very severely indeed. The hospital death-rate is always a high one. This is due to several causes. Firstly, it is usually the very worst cases which find their way to hospital. Those sent in in the ordinary course have nearly all some complication at the moment of admission. Secondly, the Sick Children's Hospital and the Children's Shelter are responsible for sending us a good number, and it is obvious that children admitted from the first probably suffer from some medical or surgical complication, while children admitted from the second must have been the victims of starvation, cruelty or neglect. I think it only right to mention

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[1] Read before the Medico-Chirurgical Society of Edinburgh, December, 1903.

[illegible] City Hospital death-rate, which for [illegible] 1900, was no less than 18.11 per [illegible] that this is not an extraordinary figure [illegible] that, over a period of twenty-two years, [illegible] was a death-rate of 18.3 per cent. in the [illegible] Hospitals.

[illegible] cases. whooping-cough is probably not, as a rule, [illegible] except in weakly children. The principal cause of death in [illegible] cough is undoubtedly broncho-pneumonia, which is responsible for most of the deaths. Convulsions due to various causes, [illegible] hemorrhage on the surface of the brain in the effort of coughing, to thrombosis of the lateral sinuses or sometimes to actual meningitis, also kill a certain number of children. In attempting to reduce the death-rate, however, the practical point is to find some method of successfully treating broncho-pneumonia.

It is obvious that in the treatment of an acute or sub-acute pulmonary inflammation, which is almost certainly due to the action of micro-organisms, and in which toxemia plays a prominent part, that everything possible should be done to maintain the patient's strength and to secure him an adequate amount of rest. But in whooping-cough this is the practical difficulty. The cases are hard to feed; they are constantly vomiting, and they soon lose what little appetite they have. At night they are frequently awakened by the occurrence of the paroxysms, even though these paroxysms are usually diminished in number when broncho-pneumonia supervenes; and the irritable state of the nervous system noticed so frequently in children with whooping-cough makes them very restless. Children are therefore apt to lose strength rapidly, and it is not at all unusual for the lung condition to ultimately become tubercular. In dealing with these cases my first object was to attempt to give them rest by lessening the number and severity of the paroxysms. To attain this object, during a period of four or five years, I made a trial of nearly all the long list of remedies suggested for whooping-cough, a list which by its length alone is sufficient to proclaim our helplessness in the treatment of this infection. Bromides, bromoform, butyl chloral hydrate, quinine, antipyrin, cocaine, belladonna, and to a lesser extent various other drugs have been used freely in our wards. Some of these are too depressing except in sthenic cases, and in the form of pneumonia we are considering asthenia is the rule. For this reason antipyrin, which I am inclined to believe favorably influences the paroxysms, cannot be safely used. I must, however, confess to a certain faith in belladonna, which can be pushed safely in children, and which, if given freely enough, seems of considerable service in some cases. I have not seen any particular advantage derived from inhalations. I regard the artificial atmospheres of creasote or eucalyptus as being to a certain extent depressing, and at the same time as rendering the patient liable to suffer when it is necessary to ventilate the room. Lastly, I have tried the somewhat bizarre treatment, recommended by high authorities across the Atlantic, of injecting carbonic acid gas per rectum. In the first case subjected to this treatment the results seemed good, but in none of those subsequently treated were any satisfactory results noted.

Putting aside the question of the paroxysms, we have used all sorts of methods of treatment for the pneumonia itself. Poultices, once much in vogue, are not at all to be recommended. The application of small blisters, which I at one time tried, did little or no good, though they were not so harmful as might have been expected. I regard the croup kettle as positively harmful unless laryngitis is present. Ice-cold compresses on the chest appeared of considerable value in some cases, and their success almost induced me to give a trial to the cold bath treatment recommended by some Continental authorities for broncho-pneumonia in children. But the want of conveniences for carrying out this treatment in the old hospital, to say nothing of popular prejudice, stood in the way. In cases with very marked cyanosis the application of leeches undoubtedly does good. As a routine treatment, however, we ultimately were content to rub the chest with stimulant oils and wrap it in a jacket of Gamgee tissue. Unless the case showed great depression, small does of ipecacuanha wine were given with a view of making the paroxysms as easy as possible, and the worst cases were given belladonna in large and frequently repeated doses. The death-rate was appallingly high; roughly speaking, two out of every three children who developed bronchopenumonia died. I am indebted to two of my former assistants, Dr. A. F. Herbert and Dr. George Carruthers, for the figures relating to consecutive cases of broncho-pneumonia treated during their term of office. The date-rate was 71 per cent., and statistics from Glasgow suggest that it is much the same in the hospitals of that city; Dr. Johnston, in his report of the Ruchill Hospital, 1901-2, giving a table of whooping-cough cases from which I calculated that 76 per cent. of the broncho-pnuemonia succumbed.

When the idea of putting the patients as far as possible in the open air first occurred to me, I was particularly influenced by two facts. The first was that I had often seen children struggle through a broncho-pneumonia only to succumb to phthisis or acute tuberculosis; and the second, that a certain number of cases used to contract broncho-pneumonia after admission, and I had every reason to believe the disease was infectious. To put the cases in the open air could hardly increase the death rate. It would probably diminish it by preventing the occurrence of pulmonary tubercle, and also by lessening the number of cases developed in hospital. Although I was aware that many writers, especially on the Continent, recommend that children suffering from pertussis be allowed out in the open air, the occurrence of a pulmonary complication is usually especially said to be a contra-indication of this treatment. Again, in this country the fear of fresh air is so great that many physicians advise that two rooms be put aside for the patient, and that all the ventilation of each be carried out in his absence, a special atmosphere being created for him with various medicated vapors. One physician of great experience in first-class practice, told me the only case of whooping-cough he ever let out of doors was one of the few which he had seen terminate fatally.

I decided, however, to risk this method of treatment, and I started with the modest number of four cots, which were placed in a sheltered position, but completely uncovered, in the neighborhood of the whooping-cough wards. The children were carried out and left for about six hours daily, provided it did not rain. The cases were selected from the worst in the wards, and indeed were regarded as hopeless. No bad results were noted, and there was a very marked improvement in some of them. These cases had been under treatment for some time previously, and had not had the advantage of the open air from the start. They therefore did not show the same recovery rate that we were to reach later, but after a couple of months I was able to get all the cases in the wards out into the open air for several hours daily, and cases admitted with broncho-pneumonia had the benefits of the new treatment from the date of their admission. The main contra-indication to the treatment was the presence of laryngitis. Children with convulsions had occasionally to be kept indoors when it was necessary to use hot baths in their treatment; but even these cases, if they did not continue to have fits, were seldom kept in doors more than one or two days. The children were warmly covered, and the chest was carefully protected with cotton wool. Screens protected the windward side of the cots, but the narrow strip of garden in which they were treated is wonderfully well sheltered.

The main effects of the treatment were briefly as follows: The whoops were unaffected in number or severity. In other words, there is no favorable influence on the infection itself. The patients took their food ravenously, and their general strength was much improved. They also slept very much better. If from wet weather they were kept one or two days in the wards—a thing that very seldom happened, as they usually were out for one or two hours, even if the weather was uncertain—they rapidly lost both their appetite and their sleep. Convulsions did not markedly decrease, so far as could be judged, but the whole nervous tone of the children seemed better. They were much less irritable and more easily dealt with in consequence. The temperature was not affected so rapidly as I expected, but there was usually a steady improvement of all the symptoms from the day they were first taken out. This improvement was very gradual, but both temperature and respirations were considerably lower after a week's treatment, and the cyanosis became much less. Another very practical advantage was the complete rest given to the wards for a varying period from one to seven hours daily. Whooping-cough wards are apt to get very unpleasant from the continual vomiting that goes on, and it is a great thing to get them thoroughly and completely ventilated with no risk of draughts affecting the patients. Lastly, while one case, which was admitted uncomplicated, developed broncho-pneumonia, although he was out daily, and several had relapses in convalescence, it may be said broadly that broncho-pneumonia of hospital origin became extinct. Tuberculous patients, it need hardly be said, did better.

The first trial of this treatment commenced in May, 1901, and was continued till the 15th of November, when, although there was no reason to believe the patients were suffering, the nurses found attending to them very trying, as the ground was constantly damp. In order to continue the treatment to the best of my ability, I removed all the window sashes in a ward of six beds, and had several new windows made, so that two sides of the room were partially open. In this ward, heated by a good stove in the centre, most, but not all of the broncho-pneumonia cases were treated during the winter. When the summer came round again this room was a very convenient place for the worst cases to sleep in, they being, of course, carried daily into the open air with the rest. This ward we named the Sanatorium, and it gave us very satisfactory results. I continued the treatment till, late in the autumn of 1902, it became necessary to move the patients to other wards, where open air treatment was impossible. It was, however, found possible to employ it again in the summer of this year.

I had expected to have been confronted with prejudice on the part of the relatives of the patients. As many of the cases treated were in an almost desperate condition from the first, it was necessary to allow their parents in frequently. I had not a single complaint from anyone. On the contrary, a larger number of severe cases were sent in, many medical men having noticed the success of the treatment. As regards the nurses, who had often to do their work standing on wet grass, their health was exceptionally good, though they wore their ordinary indoor uniform. There were no colds in the head or bronchial troubles. In fact, I was accustomed to send nurses who were breaking down in other parts of the hospital up to the whooping-cough wards for a change.

As regards the severity of the cases treated there is no doubt at all. Every case of broncho-pneumonia complicating whooping-cough is dangerous. Many were admitted cyanosed, with temperatures of 103° or 104° F., respirations of 60 to 80, and pulse running from 140 to 170. Even in the favorable cases these symptoms continued for a long time, though, as has been said above, the pulse and respiration rate slowly decreased and the cyanosis rapidly disappeared.

For purposes of comparison I have divided my cases into various periods. These periods I may say were decided on before I had any idea how the figures would work out. I had not realized how far the treatment affected the death-rate till fully two years after it was first commenced, though it was obvious the cases did better. A glance at the first table will show the effects obtained. Starting with a hospital death-rate of 71 per cent. calculated on two series of consecutive cases prepared for me by my assistants (and I may say that these cases were no worse than the average we are accustomed to), we pass on to the period which I have named the "transition period," in which the rate falls to 54 per cent. This was the period in which the first attempts at the treatment were made. It includes a group treated entirely indoors, and a second group, the members of which had not the advantage of the new conditions till they had already been some time in hospital. In spite of this it will be noticed that this second group had little more than half the mortality of the first. The next period includes the cases treated during the summer of 1901, in which all broncho-pneumonic cases had the benefits of the new treatment from the day of admission. The rate falls very markedly at once to a little over 26 per cent. During the winter months in the Sanatorium the rate was only one point higher. In the summer of 1902 all the pneumonic cases were treated outdoors as far as possible, and the Sanatorium was used for the worst cases to sleep in at night. One would have expected a still further fall, but there is a rise to 34 per cent., possibly due to the damp weather, though I do not profess to know if it was really worse than in the preceding year. A very marked rise is again noted when for reasons of administration the whooping-cough cases were moved to wards where no Sanatorium was available. In the winter months under indoor treatment the death-rate was 57.8, a figure which, if not as high as what we calculated the hospital average to be, offers at least a great contrast to that of the open-air treatment. The improvement in the indoor rate I attribute to the fact that we had learnt not to be afraid of free ventilation.

In the second table is shown the death-rate of all the cases included in the first, divided into two groups: the first of those treated indoors; the second of those which from the first, or after indoor treatment, had sooner or later the benefit of treatment under the new conditions. The difference in the rates is again very marked.

I am, of course, quite aware that small numbers of cases give misleading results, and also that figures can be twisted into meaning anything or nothing. I endeavored to avoid fallacy as far as possible by dividing the cases into groups, before attempting to ascertain what the results would be. It will be seen that, as might be expected, there are fluctuations in the death-rate. But broadly speaking, whereas under the old conditions 2 out of 3 children who suffered from broncho-pneumonia died, under the new 2 out of 3 recovered.

It is hardly necessary to add that the results obtained were also largely due to most devoted and skilful nursing. There is hardly any type of nursing more unpleasant than that of whooping-cough. The frequent vomiting, the constant fretfulness, the capricious appetite of the patients, all combine to make the work very arduous. The high death-rate is also discouraging. I have suggested the improved death-rate in the last group of cases in Table I. might be due to bolder ventilation. It is possibly also due to the encouragement given by desperate cases successfully treated under other conditions. I have also to offer my thanks to the various Resident Medical Officers who have had the cases under their immediate control, and to our consulting physician, Dr. Affleck, for much kind help given on many occasions.

TABLE I.—Cases of Broncho-Pneumonia.

Period.	Cases.	Deaths.	Death-rate per cent.
Ordinary Treatment, Series 1	21	14	66.6
Ordinary Treatment, Series 2	25	19	76.0
Hospital rate by adding above	46	33	71.0
Transition Period	22	12	54.5
Of which treated indoors	9	7	76.6
Of which treated partly outdoors	13	5	38.4
First Open Air Period	26	7	26.9
Sanatorium (Winter) Period	11	3	27.2
Second Open Air Period (with Sanatorium)	26	9	34.6
Indoor Treatment resumed	19	11	57.8

TABLE II.—Cases of Broncho-Pneumonia.

Treatment.	Cases.	Deaths.	Death-rate per cent.
Treated indoors entirely	74	51	66.9
Treated outdoors partly or entirely	76	24	31.5

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Stated Meeting, Held November 12, 1903.

HENRY HEIMAN, M. D., CHAIRMAN.

MYELOGENOUS LEUKEMIA.—Dr. Edward Miller presented a boy of eleven years having a negative family history. When first seen on September 11, 1903, he was suffering from diarrhea, and the abdomen was distended. Following an operation for adenoids a few months ago, there had been troublesome bleeding, but this was the only history of hemorrhages. A year and a half ago it was noticed that the child was becoming pale and that the abdomen was large. Examination showed the child to be well nourished and only moderately anemic. The abdomen was distended, and the superficial veins dilated. The spleen was enlarged, extending from the seventh rib in the axillary line to the crest of the ilium. The examination of the blood showed hemoglobin 63 per cent., the red cells 3,976,000, and the white cells 432,000. There were 2.6 per cent. eosinophiles. On September 9 a loud cystolic murmur developed. A more recent blood examination showed hemoglobin 54 per cent., red cells 3,232,000, and white cells 347,000. The differential count showed polynuclear nutrophiles 16.4 per cent., and eosinophiles 4.8 per cent. The patient had now been on Fowler's solution of arsenic for about a month.

Dr. D. S. D. Jessup said that this was the first case of myelogenous leukemia that he had seen in a child. The condition of the red-blood cells was very much the same as in adults. The proportion of eosinophiles was within the normal limits. The mast cells made up 10 per cent. of the number of white cells. The polynuclear nutrophiles ran from 60 to 65 per cent., which was higher than the average found in the myelogenous leukemia of adults by 10 or 15 per cent. The myelocites constiuted about 10 or 15 per cent., whereas 36 per cent. was the average in adult cases.

NODULAR TUBERCULOSIS OF THE SKIN. (ERYTHEME INDURÉ OF BAZIN).—Dr. L. E. LaFetra presented a boy of two years, whom he had first seen last June. In November, 1902, the child was circumcised, and five weeks later a swelling appeared on the middle phalanx of the ring finger of the left hand. Shortly after this a red spot appeared upon the right cheek, and subsequently ulcerated. There had been no night sweats or obvious fever. Examination showed bronchitis and slight enlargement of the liver and spleen. The examination of the eyes for tubercles was negative. On the face were two bluish patches, one on either cheek. The one on the right side was discharging thin serum. Similar nodules, evident on palpitation, were found on the skin of the legs, particularly of the back and sides of the calves. In most cases the skin over the nodules was bluish. On July 8 the dactylitis became fluctuating, and the examination of the evacuated pus was negative. On September 29 there was a mass on the left hand removed for examination; this showed a few tubercle bacilli.

Dr. Henry Koplik said that these cases were quite rare here, although he had seen such a case recently in his hospital ward. If such a case were described as tuberculosis of the skin and glands, and dactylitis, the condition would not be so well described as if it were spoken of as scrofulosis.

Dr. Jacob Sobel said that he had seen several such cases in this country, but not before in a child. The disease was more common in young women than in men. As a rule, the affection involved the lower third of the calf, whereas in the case under discussion the lesions were scattered over many other parts. The condition must, of course, be differentiated from erythema nodosum.

Dr. LaFetra said that in searching the literature the youngest patient so affected that he could find reported was a boy of about nine years. It was a more common affection in young girls, particularly those who stood a good deal. One of the names for this disease was scrofulous gumma, and this was certainly a very expressive term. In only one other case had tubercle bacilli been found, although tuberculous tissue was usually present.

Congenital Heart Disease.—Dr. Henry Heiman presented this patient, a little girl showing a marked bluish tint, and well-marked clubbing of the fingers. The dullness, so characteristic of the pulmonary stenosis, was best noted over the second interspace.

The Constituents of the Layers of a Quart of Milk.—Prof. John S. Adriance discussed this topic. He said that if sugar, fat, or proteid material were oxidized the result would be the formation of heat, the degree of which would vary with the ingredient oxidized. The heat produced by the oxidation of fat was about two and a half times greater than that produced by the oxidation of the other two food ingredients. The inorganic matter underwent no change. Milk contained all of the necessary food constituents.

The milk coming to this city could be divided into three classes: (1) That containing a little over the legal requirement of fat, 3 per cent.; (2) that containing between 4 and 5 per cent., and (3) that containing 5 per cent. or over. The best milk delivered in this city was at least sixteen hours old. The proteid material was not in true solution. The milk, when delivered to the consumer, had undergone some change. This change was the rising of the lighter material, the fat; in other words, the fat was held there only by surface tension. A bottle of milk contained at the top a layer composed of a large amount of fat. This layer was approximately the same from day to day. On analyzing this layer it was found that it contained nearly all of the fat of the milk. Most books stated that the composition of cream was the same as that of the milk except that it contained more fat, but, as a matter of fact, the proportion of sugar, proteid, and inorganic matter in the cream was much less than in the original milk, because everything else was pushed out as the cream rose. The composition of the milk examined by him was, fat, 5.02; sugar, 4.82; proteids, 3.56, and ash, 0.74. The proteid material was held there in combination with inorganic matter. The first ounce gave the highest percentage of fat. The ninth ounce contained practically 1 per cent. of fat, and this amount remained nearly the same until the fifteenth ounce was reached, which was found to contain 0.4 per cent. less than the first ounce. The last ounce contained less fat, and, hence, a larger amount of all the other constituents; in other words, the skimmed milk contained a higher percentage of proteid than the original milk. By proteid material was meant organic matter containing nitrogen in such a form that it could be utilized by the body. The point which the speaker especially emphasized was that the proteid material was decreased as the fat content increased, and that the inorganic salts, which were necessary for the bony structures of the body, were likewise decreased.

THE FUNCTION OF MATERNAL MILK IN DEVELOPING THE INFANT'S STOMACH.—Dr. Henry D. Chapin read a paper with this title. He said:

"For a number of years the discussions on artificial infant feeding have centered around the chemical composition of milk, and certain principles thus derived have been enunciated which more recent chemical research has shown to be erroneous. The older teaching that breast milk is alkaline and cow's milk is acid, and consequently alkali should be added to cow's milk, has been shown by Kerley, Gieschen and Myers to be wrong. It is well known that good results are often obtained by adding alkalis to cow's milk, but the reason that has been given is not supported by the facts. Both human milk and cow's milk are acid to scientific methods of examination. This fact can be easily demonstrated, but an indicator more sensitive than litmus paper must be used (phenolpthalein).

"At one time it was taught that success in infant feeding lay in accurate adjustment to the percentage of fat, proteids, carbohydrates, mineral matter and water of milk, plus alkali, to suit the infant's digestion. Now the same teachers are claminig that their treatment of the proteids of cow's milk was not the best and that a new method of adjusting the character of the proteids of cow's milk is proper and scientific. Further study has shown that the proteids of cow's milk are not the same as those of human milk, and not a simple mixture of caseinogen and lactalbumin as has been taught.

"The attempt to establish a purely chemical method of feeding has not succeeded. but it has pointed the way toward a clearer understanding of the true principles of artificial feeding.

"Fat proteids, carbohydrates, and mineral matter are generic terms that cover a host of substances.

"Fat includes fat of meat, butter, lard, and table oils.

"Proteids include all lean meat, flesh of birds, fish, eggs, curd of milk, and gluten of cereals.

"Carbohydrates include cane sugar, milk sugar, starch of cereals, and potatoes.

"Mineral matter includes the entire surface of the earth.

"When it is taught that an infant's food should contain certain proportions of fat, proteids, carbohydrates, and mineral matter, a wide range of possibility exists, and what argument can be more logical than that of some manufacturers of prepared foods, who take the words out of the teachers' mouths and make up mixtures that contain the same proportions of fat, proteids, carbohydrates, and mineral matter that were said to be proper, and offer them to the public as representing what some authorities advocate (?) and what can be more illogical than the same authorities descrying all prepared foods as being unscientific? This is not to be construed as advocating the use of prepared infant foods, but is to show that the teachers of scientific infant feeding have not been in an impregnable position as far as such teaching is concerned.

"All animals require fat, proteids, carbohydrates, mineral matter, and water, so it is only citing a general principle of nutrition when it is stated that an infant's food should contain them.

"Clinical results are greatly in favor of the fat, proteids, and mineral matter derived from milk of some kind as the food for infants. The source of the carbohydrates does not seem to be as important.

"It does not strengthen the situation to teach that milk should be used in infant feeding because it contains animal proteid. Any one could add dried blood, egg albumen, or desiccated meat to a food and claim that it met all the requirements of the authorities, as it contained animal proteid.

"*Young animals need milk because milk supplies forms of* *proteid that have special and peculiar functions that other forms of proteids do not have.* It is to this feature of the proteids of milk that attention is here specifically called. To bring out clearly this function, a little sketch of the place of milk in the animal economy will be helpful.

"The reproductive process in most animals consists in the development of a single cell into a perfect organism, from food derived from the parent's body. The great differences between animals lie in the manner in which this food is supplied to the germinal cell.

"In the case of a hen, all of the food is separated from the mother's body at one time, enclosed in a shell, from which the chick emerges perfectly formed. In some other birds the organs of locomotion are developed after hatching, from the food brought by the parents.

"In all forms of animal life the parent either nourishes the young from its own body, or brings it suitable food until it is able to secure food for itself, when weaning takes place.

"In animals that suckle their young the greatest variety of methods of supplying nourishment to the germinal cell is seen, but it is not all supplied in one way, in one form or at one time.

"Some animals make nests in the ground, lay eggs with a lime shell, hatch them, and then suckle the young, whose mouths are unlike their parent's, but perfectly adapted to cover the peculiar openings of the mammary ducts.

"Other animals lay an egg which is hatched in an abdominal pouch and the young is there suckled, the mouth of the young and the outlet of the mammary glands being adapted to each other.

"Other animals lay no eggs, but give birth shortly after impregnation to a rudimentary fetus whose mouth grows fast to a teat in the mother's abdominal pouch. Nearly all of this animal's development takes place on this teat. Its increase in weight is from about one-half ounce at birth to eight pounds at weaning. The mother ejects milk into a specially adapted gullet, which does not connect with the wind-pipe until the young animal is able to suck, when its mouth ceases to be adherent to the teat. As development proceeds, the young thrusts its head out of the pouch and nibbles at the food its mother eats. A little later it leaves the pouch for good. Here is the highest development of the mammary function.

"In none of these animals is there any placental connection with the mother. In past ages this method of reproduction predominated over the earth, but animals whose young were nourished in the uterus for a greater or lesser period were more successful in the struggle for existence. Modern mammals are distinguished by the formation of the chorion, which develops into the placenta, through which the nourishment is supplied to the forming organism, mammary development and nutrition not being so pronounced, although important. At one time mammary nutrition and development of the fetus were primary. Now they are secondary in nearly all forms of animal life.

"In the process of development from the germinal cell into the perfect organism, all animals pass from very simple forms to more complex ones. In the early fetal forms it is impossible to tell what kind of animal is going to be developed.

"The digestive tracts of all animals are alike and simple in the early fetal stages and develop into the more or less complex forms of the adult before the time of weaning, the mammary secretions having a great deal to do with producing this development.

"The digestive tract of the kangaroo at birth is very simple and nothing like what it is at weaning, and the stomachs of most mammals at birth are not the same as at weaning; *a profound change in the digestive tract takes place during the suckling period.*

"Colostrum, the first secretion of the mammary glands, is totally different from milk in composition and physical properties, but is particularly fitted for starting up the intestinal digestive process.

"A high authority has stated that colostrum represents an abnormal condition. If this is abnormal, it has happened to all species of mammals.

"Henry, of the Wisconsin Experiment Station, who has studied the practical raising of many species of domestic animals, reports as follows:

" 'Colostrum: This first milk is exceedingly important to the young animal at birth, and should never be withheld from it, for besides yielding nutriment it possesses properties which serve to cleanse the alimentary tract and properly start the work of digestion. . . . The calf should always get the first milk (colostrum) of the cow, as this is necessary for properly clearing the bowels and starting the digestive functions. . . . It is of the highest importance in horse rearing that the young start in life in full health and vigor, and to this end the foal should very soon after birth take a good draught of the colostrum or first milk of the dam. . . .

" 'If the young lamb is unable to draw milk within a few minutes after birth, it should have help to secure this first and most important feed. With the first fill of milk from the dam, the new-born lamb becomes comfortable and is usually able thereafter to take care of itself.'

"It is well known that within a few days after birth normal milk displaces colostrum, which is composed of fat, proteids, carbohyrates, mineral matter and water, as is milk. Milk forms curds in the stomach, which is not the case with colostrum. As these curds are formed from a portion of the proteids of the milk, this is a case where nature quickly alters the character of the proteid of the food to suit a particular purpose.

"The digestive secretion of the stomach of an adult is essentially rennet, hydrochloric acid and pepsin. The function of the stomach is to act as a food reservoir and to break down proteid tissue, so that it can be easily and completely digested in the intestine. Very little complete proteid digestion takes place in the stomach. Before pepsin will act on proteid, a combination of the acid and proteid must take place. In young animals little acid is secreted in the stomach and gastric digestion is not prominent.

"One thing about infant feeding that is noticeable is that, as the infant's stomach develops and becomes larger and stronger, longer intervals between feedings become necessary.

"It may be argued that the older infant takes more into its stomach; but such an infant's stomach is larger and more vigorous, and should empty as soon as, if not sooner, than at birth.

"During the colostrum period there is very little secretion in the stomach, and colostrum is particularly fitted for intestinal digestion. As soon as milk begins to displace the colostrum, there appears an abundant secretion of rennet in a calf's stomach, which acts on the proteid of the milk and changes the milk into a soft solid curd, or junket. Pepsin will not attack this altered proteid or curd of milk, which, being soft, is easily passed into the intestine and there digested. Thus the first function of milk is to fit the stomach for passing soft food into the intestine. The motor function is developed first. Rennet does not act on colostrum and is secreted in small amount during the colostrum period.

"As soon as a little acid is secreted by the stomach, it combines with a portion of the curd to form a definite compound which is readily attacked by pepsin. This compound is denser and tougher than the rennet curds, and unfit for intestinal digestion. The stomach has now something to do besides emptying itself, and the food remains longer in the stomach to give the pepsin time to act. As the secretion of acid increases, more of the curd combines with the acid, and there is more work for pepsin. In this way, as fast as the gastric glands develop. they find work awaiting them. Thus it is that the stomach is called into action, and longer intervals between feedings become necessary. If there was not some such provision, mother's milk ought to change in character as the digestive function becomes stronger to meet the stronger digestive juices, or atrophy of the digestive glands would ensue. As it is, mother's milk adapts itself to a weak infant or to a strong one. If the gastric secretion is vigorous, the milk becomes more solid and stays longer in the stomach; if weak, the milk forms a softer clot which easily passes into the intestine in a condition to be rapidly digested there. *Mother's milk and the secretions of the infant's gastrointestinal tract automatically adapt themselves to each other.* If mother's milk itself changed in character according to the age of the infant, it would never agree with a puny, backward infant; and if milk did not turn into a solid, but remained a fluid, the stomach would not be prepared for solid food at weaning, for there would be nothing to properly develop the motor and glandular functions.

"It has been seen that, anatomically, young animals and mothers are perfectly adapted to each other; *they are also functionally adapted to each other.*

"In the change from colostrum to milk, the mother alters the character of the proteid supplied, and the infant's digestive secretions change at the same time for a specific purpose. The proteid of mother's milk adapts itself to the young animal's digestive secretions.

"A glance at different stomachs will suggest that one form of proteid would not fit them all unless their digestive juices had different effects on it. It is a familiar fact that the milks of different species form different kinds of curds under the action of the same rennet and acid, and universal experience has shown that the proteids or curd of the milk of the lower animals does not perfectly fit a baby's stomach. The only conclusion possible is that the proteids of different milks are not the same from a functional standpoint, no matter how nearly alike they may be in ultimate chemical composition.

"In artificial feeding it is essential to supply as much fat and carbohydrates as is found in breast milk to serve as fuel for the body, and as much proteid and mineral matter as is found in breast milk to build up a strong body, or anemia, rickets, and general malnutrition will follow. It is also essential that a portion of the proteid shall be of a form that will develop the stomach, as the lack of such food will profoundly affect the general nutrition.

Fresh cow's milk is the only available source of such a form of proteid, and for this reason fresh milk should be the backbone of the baby's food. However, the proteid of cow's milk does not fit a baby's stomach and must be altered in some way to make it fit. In the cow, digestion is principally gastric, and food slowly leaves the stomach. Cow's milk curds in such large masses that it cannot readily leave the stomach. In man, finely divided food that readily leaves the stomach is natural, and human milk does not form solid curds, but flakes. Alteration of the character of cow's milk may be brought about by a number of methods, and one method may succeed when another fails.

"Sterilizing, pasteurizing, or heating cow's milk alters it chemically so that rennet will not act upon it readily. This fact is familiar to every cook, as on the packages of rennet sold for making junket for desserts will be found: "Use pure sweet milk, heat carefully until just lukewarm, remove at once from the fire, as you may overheat it, as milk or cream that has been boiled, sterilized, condensed or evaporated cannot be used." Heating milk also destroys bacteria that produce acid, an excess of which would combine with the rennet curds and form a dense mass far beyond the capacity of the infant's peptic digestion. Investigation has shown that pasteurized or sterilized milk as fed to infants is not at all free from bacteria, so a part of the benefit of heating milk lies in altering the character of the milk and preventing the formation of acid.

"The addition of alkalis to cow's milk retards the action of rennet or neutralizes the acid of the stomach, and thus throws the milk into the intestine more rapidly and in a softer condition.

"The dilution of cow's milk with plain gruels holds the curds apart and allows more rapid emptying of the stomach.

"Diluting cow's milk with dextrinized gruels supplies the mechanical effect of plain gruels, puts a modicum of starch in the infant's stomach, adds a natural promoter of gastric secretion to the food and supplies some readily absorbable food which is found in all milks, but which is reduced in quantity in diluted cow's milk.

"No artificial food can be made up that will automatically adapt itself to the normal infant as maternal milk does. The infant gets from the mother the same percentages of fat, proteids, carbohydrates, mineral matter and water, whether its stomach is weak or strong; *its digestive secretions determine how and where digestion shall take place.* The skilful infant-feeder learns to discover functional derangements. He may find that the gastric function is not normal and will possibly add a large quantity of alkali to the milk to cause it to rapidly leave the stomach as a fluid, or he may decide that a nearly soluble food is required, and peptonize the milk or stop milk entirely and feed dextrinized gruel getting back to milk gradually. Reducing the quantity of proteid of cow's milk to .25 or .50 per cent., except temporarily to correct functional disturbances, is not justified, if another form of nucleo-albumin, with more or less cow's milk, can be digested. Indigestion is being treated by partial starvation where such low proteids are supplied. It may be found that the infant is taking a soluble food which requires little digestive effort, and is not doing well. A change to milk causing immediate improvement suggests that the stomach was craving work which the curding of the milk supplies.

"A careful study of the experience of all pediatricians will show that success has not followed rigid adherence to any rule of feeding, but along adaptation of the food to the state of the infant's digestion, the most radical changes in the character of the food sometimes giving good results. In these instances the food was inelastic in its character, and only a portion of the proper functional development was being produced. The radical change of food produced a development that was needed.

"Normal maternal milk supplies the necessary quantities of fat, proteids, carbohydrates, etc., for proper structural development and maintenance of the vital processes, in forms that automatically adapt themselves so as to develop the digestive functions of the growing animal.

"It is easy to make up a food that will contain the same quanties of fat, proteids, carbohydrates, etc., as maternal milk, but experience and study only will enable the infant-feeder to do what nature does automatically—adapt the food to the conditions actually present and ensure proper functional development. Biology must be considered fully as much as chemistry in the study of artificial infant feeding.

Dr. Rowland G. Freeman said that all should feel indebted to Dr. Adriance for his careful work on the composition of the different layers of milk. The question arose as to whether this exposition would alter at all our methods of modifying milk. For practical purposes, he thought we could go on modifying milk as heretofore, such deviations as had been pointed out being lessened by the dilutions employed. Growing experience with the modification of milk had impressed most physicians with the fact that small deviations were not of much practical importance. In his hospital work he had found the house physicians disposed to use too low formulas for feeding. Such formulas were of the greatest value for short periods, but should not be kept up long. In using cow's milk, it could be fairly well adapted to the infant's stomach by extracting the whey, thus obtaining a lactalbumin milk, which would often be well digested by infants who could not digest ordinary cow's milk.

Dr. H. Koplik said that Dr. Chapin had made the statement that colostrum had a distinct cathartic function, and this might be true of the lower animals. The textbooks handed down the statement that the colostrum, as such, had a cathartic function, but he had been unable to find any recent scientific data on which to find such a statement. It was not uncommon for the new-born infant to be constipated, and, in any case, the quantity of colostrum taken by the infant would seem to be too small to produce catharsis unless the colostrum possessed very cathartic properties. The statement had also been made in the paper, that as the child grew older the number of feedings were reduced naturally because of the increasing quantity of milk secreted. There were two sets of observations for determining the quantity of milk that the human breast would deliver. In one set the quantity was found to remain about the same from the second month to the time of weaning. In the other set, the quantity of breast milk increased gradually from birth to weaning. Dr. Chapin had made the statement that the milk adapted itself to the infant's stomach, and the infant adapted itself to the milk, but to this statement he would take exception, because cases occurred in practice which seemed to negative this view. The proteid of cow's milk should be adapted to the baby's stomach, but it must be remembered that it was not at all the same proteid in cow's milk as in breast milk. Sixteen times as much phosphorus was voided by a baby fed on cow's milk as by one fed at the breast. There was no hard and fast rule for infant feeding, and we were not yet prepared to say how or why food was digested and assimilated.

Dr. Joseph E. Winters said that in the summer of 1898 he had consulted Professor Adriance with regard to milk analysis, stating that he was confident, from clinical work, that the upper layers of cream contained a very small quantity of proteid. Professor Adriance replied that, according to all analyses, the upper layer contained the same quantity of proteid as the rest of the milk. At the request of Dr. Winters, Professor Adriance made a series of milk analyses. Another series of analyses was made by Dr. Lederle, and still another by Mr. Henry C. Sherman, of Columbia University. The milk supplied for these analyses was all from the same source, and the milk was not over sixteen hours old. He was glad that the results presented this evening by Professor Adriance fully confirmed his own views of five years ago, based entirely upon clinical observation. Whenever there was a diminution of the proteid there was a corresponding diminution of the inorganic constituents, because as the cream rose there was less of the proteid, and as the proteid diminished, the inorganic salts necessarily diminished. The reduction of the proteids of the food for a long period always meant the development of rickets. He would even go so far as to assert that it was the only cause of rickets. Lime-water had been added to milk in the proportion of one-quarter for a great many years by those who had been most successful in the feeding of infants, but it was not done to render the milk alkaline. In the summer the proportion of lime-water should be greater than in winter, and should preferably be one-fourth the quantity of milk.

Dr. Henry L. Coit, of Newark, N. J., said that his experience had taught him that every baby's stomach was a law unto itself. It had taken him ten years to learn how to individualize the feeding of infants, and, he thought, with most physicians this became eventually largely a matter of intuition rather than of the precise application of scientific rules. He had had twenty-two analyses of milk made at the twelve-ounce line, and nineteen of these gave 10 per cent. The lower down one examined the milk in the bottle the more uniform would the fat percentage be found. He was not yet convinced that proteid indigestion was the most important obstacle to success in infant feeding, being rather of the opinion that the digestion of cow casein had not received sufficient attention.

Professor Adriance, in closing, said that as the fat increased the other ingredients decreased, but that the ratio was not uniform for these other ingredients. Of course, as milk was diluted more and more the error became less. The physician should, however, aim at accuracy, because clinicians had learned that a difference of even one-fourth of 1 per cent. of proteid exerted an appreciable effect upon the infant's digestion. Some years ago he had shown that the percentage of proteid in cow's milk was not 4, as usually stated in the books. Richmond, of England, as a result of thousands of analyses of milk, had confirmed this statement, and had declared that the proteid of cow's milk was ordinarily only 3 to 3 1-3 per cent.

Dr. Chapin said that a very rich milk creamed differently from milk not so rich, and he was inclined to think that if Professor Adriance had taken an average milk, having a fat content of 3 to 3½ per cent., the figures would probably have been different. Moreover, he had given us the results of only one assay, and although no doubt this was most accurate, it was still only one assay. Again, it was much easier to assay the butter fat than the proteid, and even expert chemists were not always entirely agreed as to the method of estimating the proteids. It should not be forgotten that the proteids of milk were quite complex, and that some of them had very different functions from the others. The idea of using lactalbumin had been referred to, yet he did not believe the theory was correct. It had been found that nucleoalbumin was required; the phosphorized albumins had a different nutritive value. It was known that infants could be starved on these phosphorized albumins; nature craved nucleoalbumin for the building up of tissue. The longer milk was kept the more albumoses and peptones would be present. All these facts showed how complex was the subject, and how improper it would be to take such a table as that presented by Professor Adriance and use it as a basis for generalization. He thought that Dr. Koplik had misunderstood him, for he had not stated that the bulk of the milk varied much, but rather that the infant's digestive secretions varied. He believed this whole subject should be studied more from a biological than from a chemical standpoint.

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN

A meeting of the Society was held on November the 20th, at 11 Chandos Street, Cavendish Square, W., Dr. H. R. Hutton (Manchester) in the chair.

An Anomalous Case of Diplegia was shown by Dr. James Taylor. A child of four years, soon after an operation for an abscess on the right side of the neck, became altered mentally and lost the power of walking. Additional symptoms found on examination were— occasional regurgitation of fluids through the nose, squinting, absence of knee-jerks, and marked incoordination. Most of the symptoms had passed off under treatment, but the degree of intelligence was not yet quite up to the normal standard. The diagnosis made at first was one of diphtheritic paralysis, although there was no history of sore throat. He was now inclined to look on the condition as some other form of toxemia, which had led to alterations in the cerebral cortex.

Dr. Shuttleworth had never seen mental deterioration follow immediately on diphtheria, but he recalled one case in which an attack of diphtheritic paralysis was said to be the precursor of mental impairment. In the present case he thought that some previous mental weakness had been aggravated by the acute illness.

Dr. Fletcher Beach regarded the case as one of cerebral diplegia rather than diphtheritic paralysis.

A Case of Multiple Subcutaneous Tuberculous Nodules in a child eighteen months old was shown by Mr. Frances Jaffrey. The history of the case was that these nodules first appeared when the child was vaccinated at the age of three months. Several of the nodules had softened and burst. He found that vaccination was usually assigned as the cause of these nodules by mothers, and therefore advised the postponement of vaccination if any nodules were present.

Dr. Charles W. Chapman has had a case of similar nodules in an adult which was completely cured by an internal administration of iodoform.

Dr. Cautley recalled a case in a baby ten months old, who died ten weeks later from tuberculous meningitis. At the autopsy four caseating nodules were found in the brain, also caseous glands in the mesentery and mediastinum, and miliary tuberculosis of the lungs.

Mr. Lockhart Mummery suggested the excision of one of the nodules to determine whether it was a pure tuberculous affection or a mixed one.

Dr. Eric Pritchard had seen a case in a lady which had lasted for two years, and was finally cured by arsenic.

TWIN SISTERS, WITH IDIOGLOSSIA, aged five years, were shown by Dr. G. A. Sutherland.

Dr. Leonard Guthrie remarked on the strong family likeness which such cases showed, although the particular defects were not the same. He thought that in many cases there was defective visual memory, because if the child looked away from the speaker's mouth it forgot how to form the words. The prognosis might appear to be hopeful, but he found a tendency to falling back if very careful and constant supervision were not maintained.

Dr. Parkes Weber referred to a case under his own care where idioglossia had followed on brain disease in early life. He thought that certainly the motor centres had been affected, and that there was defective cerebral development in his case. There had been very little improvement.

Dr. Henry Ashby (Manchester) did not like the word idioglossia, and preferred to describe the condition simply as defective speech. Such a condition was common in the special schools for backward children. He thought that one factor which was present was want of attention, and that this was coupled with a certain amount of mental backwardness. He would, therefore, assume some fault in the motor speech centre, combined probably with a defect higher up. The motor centre was such an extremely complicated mechanism that it was not surprising if it sometimes went wrong.

Dr. Shuttleworth agreed with the last speaker as to the frequency of speech defects in backward children. There was an element of laziness about the condition.

The President (Dr. Hutton) (Manchester) thought that the trouble was due to defective hearing and defective observation, coupled with a general lack of energy. The parents of such children were often of a somewhat low degree of intelligence, and therefore did not give to the children the proper amount of attention.

A CASE OF PREMATURE GREYNESS OF THE HAIR in a female child eleven years old was shown by Dr. George Carpenter. The condition was not inherited, and she was in other respects a perfectly healthy child.

A CASE OF GENERAL PARALYSIS OF THE INSANE in a girl eleven years old was also exhibited by Dr. Carpenter. The symptoms dated back more than a year. Most of the day she talked incoherent nonsense, and was placid and fatuous; at other times she had screaming and weeping fits which lasted for a few hours.

There was slight spasticity of the lower limbs, and the deep reflexes were increased. She had typical syphilitic teeth, pale optic discs, and a patch of choroiditis in one eye.

Dr. Fletcher Beach had collected notes of 200 cases of this affection, and in the majority of these syphilis was present. In children general paralysis usually developed at the time of the second dentition, and there were no delusions of grandeur such as were met with in the adult type, but simply screaming and emotional disturbances.

Dr. James Taylor said that in his experience such cases commenced with gradual dementia and had associated fits, tremors, inactive pupils, and excessive or absent knee-jerks. In the majority there was the definite association with hereditary syphilis. The physical conditions in children were the same as in adults, but the mental conditions were different—namely, simple dementia in the former without delusions of grandeur.

A CASE OF EXTENSIVE IMPETIGO CONTAGIOSA BULLOSA in a child of three years, which bore a superficial resemblance to psoriasis, was also shown by Dr. Carpenter.

Mr. Pernet expressed the opinion that it was really psoriasis.

THREE CASES OF SARCOMA which had been operated on by Mr. Douglas Drew were described: (1) a spindle-celled sarcoma of the muscles of the back of the forearm; (2) an adeno-sarcoma of the testis; and (3) a round-celled sarcoma of the upper jaw.

A CASE OF CONGENITAL HEART DISEASE, WITH DYSPHAGIA, was shown by Dr. Eric Pritchard in an infant of five months. The difficulty in swallowing appeared to be due to incoordination of the muscles of deglutition. The child was gradually sinking into a marasmic condition, although the cardiac murmur was diminishing.

Dr. Sutherland had not met with the association of dysphagia with congenital cardiac disease, but agreed that dysphagia in infants was usually due to imperfect coordination, and said that time usually cured the condition.

AN UNUSUAL CASE OF CONGENITAL HYPERTROPHIC STENOSIS OF THE PYLORUS was brought before the Society by Dr. Edmund Cautley. The patient died at the age of fourteen weeks, and the pylorus presented the usual characteristics, but both small and large intestines contained a considerable quantity of normal feces. While under observation he had gained thirteen ounces in weight during one period of two weeks, and six ounces during another period of one week. During life peistalsis was noted on one occasion only; the pylorus was palpable, the stomach was moderately dilated, and vomiting was present, but was not characteristic. There was not marked constipation, and even eight days before death a large and almost normal stool was passed. Dr. Cautley pointed out the difficulties of diagnosis in a case of this nature, and thought that many such were overlooked. Operation might have saved the child's life, but the case was regarded as a somewhat mild form of the condition, and later on acute diarrhea rendered operative interference inadvisable. He thought that the absence of characteristic vomiting in this instance might be urged as an argument against the view that the hypertrophy was due to spasms.

Two Cases of the same Disease, which had been successfully treated by pyloroplasty, were read by Mr. Clinton Dent.

A Case of Hypertrophic Stenosis of the stomach of a child two months old, which had been diagnosed and for which the patient had been admitted for operation, was shown by Dr. Alexander Morison. While under observation the patient vomited very little, and only occasionally exhibited gastric peristalsis. Operation was deferred and the patient was discharged, but returned five days later in a collapsed condition, with a temperature of 90° F., and died soon afterwards. At the necropsy the pylorus was found to be large, long, and hard. The stomach, inflated with air, only required the cardiac end to be ligatured to remain inflated, as the pyloric end was impervious. Dr. Morison dwelt on the necessity for operation in such cases, even when the condition was merely suspected to exist.

Mr. Howell Evans said that with congenital hypertrophy there might be a marked degree of spasm, which when aggravated by irritation, as from ill-digested food, would lead to dilation. He narrated a case on which he had been called to operate, but the patient became so collapsed that he was not able even to find out the condition of the pylorus.

Mr. Turtle had seen five cases operated on by dilation of the pylorus during the last twelve months, all of whom had recovered. Three of the cases returned later with diarrhea of a very troublesome nature. He suggested that this might have been due to overstretching of the pylorus, so that it was unable to retain the food in the stomach sufficiently long for digestion,

EDITORIAL

DEPENDENT CHILDREN.

The Thirty-First Annual Report of the New York State Charities Aid Association contains some interesting comments on the children cared for during the year. Almshouses and Insane Asylums are a pitiful necessity that inspire neither hope nor pride in the heart of the tax-payer, but the care of destitute children is appealing, and the wisdom with which the committees have managed their work shows an interesting outlook.

The Association had 1380 children under the oversight of its committees on October 1, 1903.

Of these 415 were in free homes, and 244 in boarding homes, and 721 with their mothers in institutions. This inexpensive and beneficial method of giving children a family life, has cost but twelve thousand dollars for placing and supervision, as against a yearly outlay of $100,000 that would be required to maintain them in an institution. Nearly five hundred situations for destitute mothers with their babies were secured during the year.

During the past five years, 176 motherless babies have been placed in permanent homes for adoption.

The placing of children in homes, while a calculable saving to the State, is an incalculable benefit to the child, for the homes in which the children are placed are generally simple comfortable homes of fairly well-to-do people, farmers, mechanics, and shop-people. Sometimes professional or successful business men adopt children that are foundlings or waifs.

Under the supervision of the agency the homes in which the children are placed are visited twice a year, in case pecuniary circumstances or death of one of the parents should make it necessary to change the home.

The system of requiring part payment of the relatives of children in institutions in New York City, who, though unable to support their children can make some contribution towards their support, has resulted in a very considerable saving to the city, and a strengthening of the feeling of responsibility on the part of the relatives.

To physicians who are constantly in touch with the pathetic dependence of an abandoned or destitute child, this work, so much better in its results than institution work, is very hopeful.

CLOTHES AND OTHER THINGS.

There has been so much clever advertising concerning hygienic underwear that the public has been led imperceptibly to believe that there is a specific virtue against cold in certain weaves and meshes, and the tendency is toward the substitution of cottons and linens in place of woolen fabrics in winter. At least this appears to be the idea that patients have concerning their doctor's advice.

In the widespread reaction against woolen underwear, flannel petticoats and warm stockings the "new" mother seems to think that her physician is prescribing a modern discovery for her child, instead of realizing that he is only trying to mitigate a very bad hygienic state of affairs in the overheated atmosphere in which his patient lives. Even though it be winter, it is impossible for anyone to be comfortable with wool next to their skin when an apartment or house is heated to a temperature between seventy and eighty. Physicians who advise light weight clothing that allows the heat of the body to pass off readily while in the house, and an exceedingly warm set of outer garments for outdoors, are simply adapting the clothing to conditions which they can not overcome, and are infrequently laying up a stock of snuffles and coughs for the children, in the spring and fall. Then, after furance and steam heat is dispensed with, the general temperature of the house is much nearer that of the outdoor air, but it is likely to be at least twenty degrees cooler than what the child has been accustomed to in the winter weather.

One fallacy of the idea lies in the belief that if the lightweight undervests were sufficient in January they ought to be sufficient in May and October. These months, as well as the summer months in the cold climates of the Adirondacks and Maine, when children should be provided with flannel and woolen garments to wear on days when the temperature is cold. We incline to think that the old adage of wool or half wool and half cotton undergarments for children up to two years of age is the most practical. Of course this requires an exception in the very warm weather of cities. Perspiration and prickly heat will occur with unpleasant consequences if an infant is too warmly clothed, but when one remembers the lack of exercise and the inability to get out of draughts, as well as the damp condition of the clothing which so often occurs one feels like warning mothers that the old-fashioned idea of the woolen binder and knitted socks may be safely carried out with very few judicious exceptions throughout infancy.

The hardening process which some advise is generally but an artificially applied prescription of common sense to the children of wealthy homes where there is nothing naturally hardening in the hot-house atmosphere. The majority of children, however, are brought up in town and country homes where the indoor heat is irregular, and often insufficient. They run in and out of doors freely, without the careful attention of wrapping up each portion of the body evenly. It is therefore, we believe advisable that the body should be evenly clothed in warm flannel. Thus the child whose own heat is not used and preserved by warm underclothing is at a disadvantage in the first days of outdoor life, especially in the raw spring days. We would suggest that if at no other time warm underclothing is used, that it be on hand for country days, when indoor and outdoor temperature is alike raw.

It is impossible to advocate any one method of clothing for all children. The over steam-heated class, whose physicians prescribe well-advertised meshes of various fibres are but a small percentage of children. The main underlying principle is to teach a child to create its own heat, by exercise, rather than to depend upon artificial heat, and then to conserve that heat as the animals do by warm clothing. For the change of temperature during the passage from indoors to outdoors is not as perceptible when the child is surrounded by a layer of its own bodily heat that is not too easily radiated through the clothing.

There is a vast difference in children; some are so full-blooded that the slightest exercise causes them to perspire, and to readily catch cold if the changes are extreme; these should be lightly clothed, and especial care given to draughts. Others become blue and livid with cold, through poor circulation; these should be clothed in wool, or half wool and half cotton underclothing from wrists to ankles and wear merino stockings and warm overshoes in cold weather, so that they may waste no particle of their natural heat in warming the outer air.

The mother who swathes her year-old infant in flannel bands and shirts and jackets when the temperature is 95 degrees nad wonders why it has prickly heat is as unwise, but no more so, than the mother who casts off the woolen band entirely all summer, regardless of cool mornings and sudden breezes and wonders why the child has diarrhea. As the wise woman told Tom De Willoughby, "the medjumer you are with children, the better". So we advise very strongly from principle and experience that the majority of children summer and winter should have on hand moderately warm underclothing, to be used or not with discretion, according to the temperature of their habitation, and that in cold weather they should help to equalize the difference between indoors and out, by the addition of warm outdoor garments, of which the woolen sweater is perhaps the most useful.

ABSTRACTS

Exodin, a New Purgative.—WILHELM EBSTEIN (*Deutsche medizinische Wochenschrift,* Jan. 1, 1904).

Exodin is a yellow powder, odorless and tasteless, insoluble in water and with difficulty dissolved in alcohol. Since Jan. 13, 1903, the author experimented with it very extensively in the University and in his private clinic, as well as in consulting pracice. This paper is based upon numerous histories of more or less obstinate constipations in males and females of all ages. The remedy never causes unpleasant by-effects, such as dyspeptic symptoms or eructations. It usually acts in from 8 to 12 hours. The unpleasant diarrheal discharges produced by many otherwise effective purgatives are absent with exodin. In most cases the first passages are mushy and even solid. In the course of the next few hours there are usually from one to three more passages, the last being not infrequently thin. The feces preserve their natural color. In extremely rare cases the first evacuations are diarrheal; entirely watery discharges were hardly ever observed. Once in a while the remedy may be ineffectual, but this is wholly exceptional. The action of exodin is midway between laxative and purgative. It can be used as an evacuant in simple constipation in otherwise healthy persons and also when sluggishness of the bowels is an accidental complication or a part of some other affection. In pregnancy, even during the first two months, exodin has, when all other laxatives failed, proved very efficacious and harmless, effecting evacuation of abundant stools without any trouble. The use of the drug at intervals showed that it is always equally active whenever readministered.

Formalin Lamp as Disinfector.—In the *Therap. Monatshefte,* Nov., 1903, DR. SEMBRITZKI, of Königsberg (Prussia) says that formalin is most effectively and conveniently used as pastils vaporized in the formalin lamp. Its employment effects both the inhibition of germ growth and deodorization. It rapidly destroys the bad odor of waiting-, sick-, bed-rooms and nurseries. It is wholly free from fire danger. The flame should be turned so low that but one pastil is vaporized in the course of a night. This causes no discomfort whatever. The author is greatly pleased with the action of the formalin lamp, not only in infectious diseases, but especially in affections of the respiratory organs, where air purification is essential, as in coryza, bronchial catarrhs, influenza, phthisis, etc. Especially brilliant results has the lamp given in whooping-cough. The toxine of pertussis is still unknown, though its specific germ has been isolated; but it is doubtless present in the breath and sputum. Efforts have long been made to sterilize the air by ventilation, phenol, etc. Here formalin vaporization renders the air antiseptic as well as aseptic. The author prescribes it for every case of pertussis and always had excellent results; often the disease is cut short and generally it is rendered much shorter and milder. Similar experiences have already been recorded by Dr. Jezdik, of Prague (*Zeitung der böhmischen Aerzte,* Sept. 14, 1901), and Dr. Lamallerée, Varennes (*Revue Mensuelle des maladies de l'Enfance,* Feb., 1902). If the vaporization is carefully controlled, no irritation will be set up. The lamp should contain two or three pastils, the flame being kept very low. It is placed into the sick-room or into an adjoining apartment. The room in which the patient is kept should be exchanged every day and the one not used should be well aired.

The Diagnosis of Tuberculous Meningitis by Modern Methods.—Two useful articles on the application of modern clinical methods to the diagnosis of this disease have recently appeared in the *Gazette des Hôpitaux,* Nov. 7th and Nov. 10th, 1903. Trémolières reviews the whole subject at considerable length, and from his paper we extract the following:

1. *Lumbar puncture,* introduced as a therapeutic measure in 1890, so far failed in its first object that, but for its diagnostic value, it would probably have already fallen into disuse. Speaking of the technique of the operation, the writer recommends a platino-iridium needle, on account of its superior flexibility, as preferable to the ordinary trocar; in children he advises that the puncture be made in the middle line rather than laterally, between the 4th and 5th lumbar vertebrae. A properly carried out lumbar puncture ought always to yield some fluid; if only a small quantity is withdrawn, without aspiration, the patient being kept horizontal, no danger need be apprehended; at the worst, some pain in one or other thigh if a nerve be touched during the operation, and slight headache, may be anticipated. Lumbar puncture is supported better by patients suffering from tubercular meningitis than by others, and its two-fold action in lowering the intra-spinal pressure, and diminishing the amount of toxine in the nervous system, often has at least a palliative effect. This, however, as has been said, is of much less importance than the aid which recent researches have enabled us to obtain in point of view of diagnosis.

2. Normally, the cerebrospinal fluid contains no cells; it is hypertonic in relation to blood serum, its freezing-point varying between 0.72 and 0.75° C., while that of normal blood serum is 0.56° C.; it has a pressure of from 40 to 60 mm. water (Quincke), or 20 to 25 mm. Hg. (Lewkowicz).

3. *Physical alterations in the cerebrospinal fluid.*—From the colour alone it is impossible to infer much. It may be clear and

limpid, yellowish (from hemorrhage), or contain lymph and even pus; and while the former are more characteristic of tuberculous, and the latter of other bacterial forms of meningitis, the aspect alone is too inconstant to be a safe guide. In all forms of meningitis the fluid generally coagulates on standing. *Cryoscopy.*—In acute (tuberculous and other) forms of meningitis the freezing-point is raised to between 0.56° and 0.48° C.; that is, the fluid becomes hypotonic in relation to blood serum. This hypotonicity may be demonstrated otherwise than by cryoscopy—by testing its *power of hemolysis.* Under normal circumstances the cerebrospinal fluid does not dissolve red corpuscles, but it has recently been shown that in tubercular meningitis it will do so. If, therefore, to a small quantity of cerebrospinal fluid we add a drop of the patient's blood, shake, and centrifuge the mixture or allow it to stand for ten or twelve hours, the superjacent fluid will have dissolved the corpuscles and be tinged with hemoglobin if the cerebrospinal fluid be hypotonic; while, if it be normal (hypertonic), the corpuscles remain unaltered and the liquid colourless, and even if distilled water is dropped in, it is not until an almost equal bulk has been added that the corpuscles are laked. In meningitis, especially the tubercular form, the pressure is greatly increased (300 to 700 mm. of water), as shown by the jet in which it flows from the cannula when the trocar is first withdrawn. These signs—altered appearance, hemolytic reaction, and increased tension, are, however, somewhat variable in tubercular meningitis, and occur in other nervous diseases; more useful information can be got from chemical, cytological, and bacteriological means.

4. *Chemical examination.*—Normal cerebrospinal fluid contains no proteid other than globulin—serum albumin, fibrinogen, and fibrin ferment are absent. In tuberculous meningitis the proteid is increased, and the presence of serum albumin may be demonstrated by boiling after the serum globulin is precipitated by sulphate of magnesia. Fibrin occurs in it in all meningeal affections, least abundantly in those to tubercle. In these the clot is white and hard and difficult to spread on cover glasses; in other forms of meningitis it is soft and yellow and can easily be spread in films. Normally, the pia-arachnoid has the property, unique among serous membranes, of preventing the transmission through it of such substances as iodides, salicylates, methylene blue, etc., when taken by the mouth. When, however, it is inflamed, it admits of their passage, and this permeability has been demonstrated for iodide in about half of all cass of tuberculous meningitis in which the experiment has been made, and also in syphilitic and cerebrospinal meningitis, and in ventricular hemorrhage. It is thus only a general sign, and not one indicating any special infection. Up to the present, no diagnostic aid has been yielded by experiments on the toxicity of the fluid in pathological conditions.

5. *Bacteriological Examination.*—The only certain sign that a meningitis is tuberculous is the discovery of the bacillus. This may be sought directly in the centrifugal deposit, or, taking advantage of the fact that all formed structures are entangled in the meshes of the clot, the clot may be digested with artificial gastric juice and the resulting emulsion centrifuged. With care the organism can be demonstrated in the fluid in about 50 per cent. of cases. Trémolières also discusses the best methods of recognizing the organism by culture and inoculation; these we may dismiss without remark, since the time (three to six weeks) required for their completion renders them unpractical clinically. It is, however, of interest to learn that tuberculous cerebrospinal fluid is but slightly virulent—twenty times less so than the serum from a tubercular pleurisy.

6. *Cyto-diagnosis.*—This gives immediate and reliable information. Three or 4 cc. of the fluid should be centrifugalized rapidly for ten minutes and the minute deposit spread on half a dozen cover-glasses, which are then fixed and stained in the susual way. Normally, cells are absent or very few; in meningitis they are very numerous. In tuberculous meningitis they are exclusively lymphocytes; in septic meningitis they are polynuclear leucocytes. The rule thus broadly stated has, however, exceptions, and care must be exercised in interpreting the appearances found. Thus, in a few cases of tubercular meningitis the polynuclear leucocytes predominate, possibly from a mixed infection, or possibly on account of old caseous foci near the meninges. In other (bacterial) forms of meningitis a polynuclear leucocytosis may give place, towards the termination of the disease, to lymphocytosis—a change indicative of cure. Again, a few lymphocytes, but never so many as in tubercular meningitis, may occur in the cerebrospinal fluid in pneumonia, and such chronic nervous diseases as tabes, multiple sclerosis, and cerebrospinal syphilis. With these reservations the presence of lymphocytes or polynuclears in abundance is, in the great bulk of cases, indicative of tuberculous or septic meningitis as the case may be.

The second article is an analysis of two Theses (Lutier, *Nouveaux procèdes d'investigation du méningite tuberculeuse*, Paris, 1903); and Percheron, *Du diagnostique de la méningite tuberculeuse*, Paris, 1903; and Percheron, *Du diagnostique de la méningite tuberculeuse chez l'enfant,* Paris, 1903), and covers much the same ground as the preceding paper, but deals more speciallv with cyto-diagnosis. On the question of tension, appearance, clotting, and toxicity, Lutier and Percheron agree with what has already been stated. Their analyses showed that, in addition to the presence of fibrin, the chlorides were diminished in the cerebrospinal fluid in tubercular meningitis. In some cases they got a feeble agglutinating reaction toward Koch's bacillus. *Cyto-diagnosis.*—A great number of cells is present; this rule is invariable. They are usually lymphocytes. Of 134 cases, in 118 lymphocytes predominated, in 2 lymphocytes and polynuclears were equal, in 10 polynuclears were in excess, and in 4 there was first a polynuclear leucocytosis, then a lymphocytosis. Percheron is further of opinion that a predominance of polynuclears almost always coincides with the presence of tubercle bacilli, a fact which affords an easy means of avoiding a possible error. *Bacteriological examination.*—Both writers agree that it is easiest to find the organism in the cerebrospinal fluid towards the end of the case. Percheron got it in 7 out of 16, and Lutier in 15 out of 25 cases. *Cryoscopy.*—Lutier found that the cerebrospinal fluid was hypotonic in 11 out of 12 cases of tubercular meningitis. While, therefore, this is a very common sign in the disease, it does not serve to distinguish it from other varieties of meningitis, in which it may equally be present. When it exists it is a good positive sign of meningitis; its absence has no negative value. *Permeability to iodide.*—This was first observed by Percheron in 3 out of 4 cases, by Lutier in 23 out of 42 cases. Summing up, Lutier says, "Inoculation is the only certain test, but it is slow. Cyto-diagnosis is the quickest and most practical, and in most cases furnishes immediate information."

Hysteria in Childhood forms the subject of two papers in the *Jahrb. f. Kinderheilk*, Bd. 58, Heft 5 u. 6, Dec. 1903. Thiemich lays stress on the fact that the majority of the cases are characterized by: (1) *absence of hysterical stigmata* (hysterogenetic zones, hemianesthesia, etc.); and (2) their *monosymptomatic character.* These rules apply especially to young children. As puberty is approached the disease assumes more of the adult type. This absence of stigmata deprives us of an important aid in diagnosis, and we are often led to the recognition of hysteria, especially when, as is so often the case, it assumes a "massive" form—e. g. complete paralysis of a limb, atasia-abasia, or mutism—by the disproportion between the cause, be it trifling injury or fright, and the sudden onset of the symptoms in their full severity. The diagnosis is confirmed by the rapid cure which follows suggestion. The monosymptomatic nature of the hysteria of childhood is due to the comparative simplicity of the psychology, and the normal greater suggestibility of the child. As to the *development of hysteria,* Thiemich dwells on two specially striking facts: (1) the frequency of certain forms in young children, which are rarer in later childhood; and (2) the great influence of training and environment. The disease probably does not occur before the second half of the second year, contrary to the teaching of some French writers. The most common hysterical manifestations in early childhood are those which follow some organic disease from *auto-imitation,* and the nature of such cases is especially liable to escape recogntion. As instances of auto-imitation, Thiemich mentions patients in whom for months together the bowels never acted without enemata, notwithstanding that the children were in every respect healthy, and the original causes for which injections were ordered had long disappeared. In a similar way diarrhea may persist for psychical reasons; the child, after a gastro-intestinal catarrh is cured, continuing to have five or six small, quite normal motions in the day, his sleep, however, being undisturbed, and any distraction diminishing the frequency of the motions. So also hysterical cough, even hysterical prolapsus ani may occur. All these agree in being psychically caused reproductions of diseases which have made a deep impression on the child's mind. Similarly, after a fall or slight illness we may have monoplegia or astasia-abasia. The headaches of school children are also often hysterical, as is shown by the fact that often the simplest drug, without any other alteration in the habits, is enough to cure what has been a daily occurence for months. *Imitation of their parents* is also a cause of hysterical affections in childhood. The writer has seen the child of a diabetic acquire polydipsia and polyuria to such a degree as to disturb sleep and seriously affect nutrition. Some cases of enuresis are perhaps of simliar nature. Doubtless most of such imitative or auto-imitative children are also neuropathic, and moreover, pay an unchildlike attention to ailments and their treatment. Thiemich most strongly emphasizes the fact that a great deal, if not all, of hysteria in children is due to their up-bringing, and to the undue fostering of the emotional side of their character by thoughtless parents. Many of the subjects of hysteria are delicate in other respects, showing, in particular, signs of neurasthenia—increased reflexes, rapid exhaustion, vaso-motor irritability, various "phobias," and the like. At this age hysteria is readily cured, and its mono-symptomatic form is an expression of the fact that there is no deeply-rooted affection of the whole personality.

In the second paper Bruns gives some statistics of the frequency of hysteria under the age of 16. Such patients form about 2 per cent. of all the nervous cases; he sees about one case of hysteria in a child to every four in adults. Most cases occur between the seventh and twelfth year; much more rarely earlier. His youngest patients were three years old. In general, boys suffer from worse forms of hysteria than girls. The disease is as common in country children as in those bred in towns, and in the former frequently takes such severe forms as chorea magna with delirium, alternating paralysis and contracture, etc. Among the principal forms of hysteria in childhood are paralysis with contractures, neurlagia of joints, speech disturbances, spasms of all kinds, varying from mere twitchings of muscles to chorea magna, tics, and anorexia, vomiting, etc. Astasia-abasia is not infrequent; Bruns has seen 15 cases. Though hysteria is usually monosymptomatic, combinations of various forms do occur. The absence of hemianesthesia, contracted visual fields, hysterogenetic zones, and other stigmata, may perhaps be because these occur in adults largely as the results of suggestion derived from clinical examination, whereas the simpler mind of the child does not readily tend to accept these unfamiliar ideas. The diagnosis rests on much the same points as in the adult, except for the absence of stigmata. In cases of organic disease whose course is anomalous, we must always, especially towards convalescence, be on our guard against auto-imitation. At least 90 per cent. of cases are curable, and the cure is generally permanent. Bruns lays stress in the treatment on the removal of patients from their homes, on taking the child by surprise with forcible curative suggestions, and on the intentional neglect of symptoms. Such rough methods as the actual cautery, etc., are never necessary.

Pulse and Arterial Tension in Diphtheria.—DENIS (*Rev. Mens. des Mal. de l'Enf.*, December, 1903) basing his observations on about 400 carefully studied cases, believes that a knowledge of the character of the pulse and the arterial tension in diphtheria is of decided value from the standpoint of prognosis. The diphtheritic toxin causes an increase of the pulse rate and a lowering of the arterial tension, and the degree of change is a measure of the intoxication. In moderately severe cases the average pulse rate runs from 100 to 120. Grave cases usually show a somewhat higher rate, but the rate never remains over 140 for any great length of time: either death supervenes early or marked improvement sets in. Indeed, some authorities go so far as to say that "death is the rule if the pulse exceeds 150." It has been noted that the injection of antitoxin is followed within a few hours by a decided fall in the pulse rate, except in the severest cases. Sudden increase of the pulse rate is usually a sign of bad prognostic import. The onset of convalescence is usually accompanied by a more or less marked bradycardia, but it is to be noted that in these cases the ryhthm is perfect, the volume good and the tension normal or nearly so. Bradycardia with very low pulse tension is of the gravest prognostic import, so that sudden fall in the pulse rate associated with decided lowering of tension, is often the precursor of death. In the great majority of cases the pulse is regular throughout the course of the disease, although in the convalescence of very severe cases, irregularity and intermittence may occur. The direct estimation of the pulse tension may be of very great value, and the study of rate and tension together afford an excellent guide as to the general condition of the patient. (Of late, attention has been called to the value of systematic estimation of pulse tension as a means of determining the amount of stimulation necessary in a given case.—ED.)

Situation and Physiological Displacement of the Apex of the Heart Between the Fifth and Fifteenth Years.—TERRIEN and LAMY (*Rev. Mens. de Mal. de l'Enf.*, December, 1903).—In chlidhood the apex beat of the heart is in the fourth interspace, when the child is erect. In the horizontal position, the apex beat is found to the left of the midclavicular line in the first years of life, in this line at about the seventh year, and within this line after this time. The authors have studied the actual mobility of the heart in children without cardiac or pulmonary lesion. The position of apex beat was determined in the following positions:

1. Dorsal decubitus, the child being absolutely horizontal.
2. Right lateral decubitus, with the right arm held at a right angle to the body, in order to have a uniform position for examination.
3. Left lateral decubitus, with the left arm at a right angle.

As the result of a great many carefully studied cases, the authors have reached the following conclusions:

In the dorsal decubitus, the apex is found in the fourth interspace, outside the midclavicular line up to the fifth year. At ten years, the apex reaches the fifth rib in the midclavicular line, and toward the fourteenth year it reaches the fifth interspace within the line.

In the left lateral decubitus, the mobility of the heart is found to be very considerable, even in the earlier years of life. The apex moves down and out. At five years the lateral motion amounts to about 4-5 inch, the vertical to 1-5 inch. At seven years the lateral movement is almost an inch and the vertical over half an inch. Between twelve and fifteen years the lateral movement amounts to 1 1-5 inches, and the vertical to 1 inch.

In the right lateral decubitus, the displacement is never nearly as great as in the left lateral, the movement amounting to about 3-5 in ch, and being for the most part horizontal.

It was noticed, furthermore, that when the displacement in the left lateral position was considerable, it was only slight on the right side, so that the child must be placed in both positions, in order to judge of the complete cardiac mobility.

BOOK REVIEWS

LATIN GRAMMAR OF PHARMACY AND MEDICINE. By D. H. ROBINSON, Ph.D. 4th edition. Revised by Hannah Oliver, A.M. P. Blakiston's Son & Co., Philadelphia.

This is a very handy volume for students of pharmacy and medicine who have never had any training in Latin and it can be thoroughly commended as practical and trustworthy.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY FOR 1903. A yearly Digest of Scientific Progress and Authoritative Opinions in all branches of Medicine and Surgery, drawn from journals, monographs, and text-books of the leading American and foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the editorial charge of GEORGE M. GOULD, A. M., M. D. In two volumes—Volume I., including *General Medicine*, Octavo, 700 pages, fully illustrated; Volume II., *General Surgery*, Octavo, 670 pages, fully illustrated. Philadelphia, New York, London: W. B. SAUNDERS & Co.. 1903. Per volume: Cloth, $3.00 net; half morocco, $3.75 net.

Of the different year books published in this county, there are but two that at the present time merit the serious consideration of the profession.

Of these more thorough performances the American year book has always taken a pre-eminent place. In fact, it is the only year book in the strict sense. 'Progressive Medicine, its only serious competitor, being a quarterly, rather than a yearly, although its digests are yearly.

Of the faults of year books in general this from the house of Saunder's has the fewest. Some are incident to the style of such works. The scrap book character has not been edited out of the book. In fact, although there is an editor, it is impossible to see just wherein he exercises his capacity. If a true editorial supervision were made the subjects would be grouped better and the book would not read like an enlarged dictionary.

The abstracts on pediatric literature are very excellent, some of the best in the book, and the attention paid to physiological chemistry is worthy of commendation. The abstracts on Materia

Medica and Pharmacology remind us more particularly of the pamphlets gotten out by the different pharmaceutical houses. Everything is favorable and all the new drugs are just right. This is not as it should be, as few of the unfavorable reports concerning drugs are published, and some are apparently praised much above their merits, usually in the language of the authors themselves. This is a department that is particularly difficult to handle, and no suspicion of undue influence should enter into its construction.

The chapter on nervous diseases is excellent: that part devoted to mental disorders is worthless. More care should be devoted to this subject in a work of this kind when it is recalled that such an enormous number of people suffer from mental disorders and become charges on the public.

A LABORATORY TEXT-BOOK OF EMBRYOLOGY. BY CHARLES SEDGWICK MINOT, LL.D. (Yale), D.Sc. (Oxford), with 218 illustrations. Philadelphia: P. Blakiston's Son & Co., 1903. Pp. i., 380.

Although the author in his preface states that this volume is intended for use as a laboratory guide for the use of students, it is really a great deal more than this; for it will serve the owner well both as a reference book and as a work worthy of careful reading. The object is a threefold one, viz., "to explain adult anatomical relations, to illustrate general biological principles, and to afford insight into pathological processes," and no better earnest is needed of how well this has been done than the knowledge that Prof. Minot is one of our foremost American embryologists and leaves the stamp of honest scientific endeavor upon all that he does.

For the average medical man, however, we are inclined to think this work of less practical value than the author's "Human Embryology," because its foundations are laid down on somewhat broader zoological strata than the busy practitioner is likely to attain to. Of especial interest to medical men are chapters I., II., III., VII. and VIII. Chapter I. treats of General Conceptions in Biology, such as: the vertebrate type; the law of unequal growth; the law of recapitulation (Biogenetic law); the theory of Heredity as taught by Nussbaum, and general evolutionary hypotheses of Darwin and Weissmann. The early development of mammalia occupies the next chapter and is traced from the spermatozoon and ovum through the origin of the nervous system, heart, and blood vessels. Chapter III. describes the human embryo from the second through the eleventh stage; its appearance upon the twenty-sixth and twenty-eighth days and also during the second, third, and fourth months of intra-uterine life. The function of menstruation and the development of fœtal membranes are taken up in the eighth chapter, and chapter IX. is devoted to the laboratory technique of developing and preserving specimens for study.

Considered as a whole this volume is a decided advance upon laboratory methods as usually taught in text-books and it ought to prove very useful to all who are interested in practical methods of embryological research.

A NARRATIVE OF MEDICINE IN AMERICA. By JAMES GREGORY MUMFORD, M. D., Assistant Visiting Surgeon to the Massachusetts General Hospital and Instructor in Surgery in the Harvard Medical School. J. B. Lippincott Company: London and Philadelphia.

Among the many biographies forthcoming to-day, the recollections of famous men, and the anecdotal memoirs of high and of low life of the last two centuries, this volume comes with delightful interest and refreshing simplicity. It is not comforting to realize how few details are known of the lives of our famous physicians and surgeons of the past, and how slight is the knowledge of their personality to-day; while the acts and words of men who accomplished infinitely less are trite sayings in schoolboy's mouths.

It is, therefore, with pleasurable anticipation that one opens this book; and it is with strong personal interest that the last pages are reluctantly turned. Delightfully free from statistical detail, one is immediately carried along upon a smoothly flowing tide of narrative from one celebrity to another, perhaps his friend or pupil. Constantly the river of events parts to disclose a charming personal touch of humor, an anecdote which should have become famous long since, a clever portrayal of the genial nature of some man hitherto remembered only in connection with purely technical matters. It flows on sparkling and rippling with humor in many places, deep and impressive in others; full of the spontaneity and human nature of our early physicians, but fraught with the serious side, the terrible struggles and hardships, the ever-present desire in their hearts for more light, more knowledge, the power to advance.

Always there is the background of history, and the cause and effect of the internal dissensions show plainly their impress upon the medical brotherhood. From the earliest colonization of this country up to the Civil War there are portrayed the constant efforts of the brave men struggling to advance the well-being of humanity, contending against disease and the terrible effects of war and privations, always with scanty and inadequate resources.

The pages of the layman's history of the Revolution do not describe the interruption it caused the young medical schools, just beginning to establish themselves, nor the hopes and fears of the surgeons, laboring to save the rank and file, and seizing every opportunity for research and discovery. But the author's book is devoted to this *histoire intime* of the profession and vividly depicts the struggles and hardships of its infancy.

Dr. Mumford's volume is certainly delightful; it has been gracefully compiled with just enough lightness and anecdote, with a happy omission of needless detail, and with a very comprehensive, chronological survey of the many splendid lives that should be our professional examples to-day; but perhaps most of all it is appealing in its whole-souled optimistic enthusiasm for the medical profession. The whole spirit of the book calls to mind Robert Louis Stevenson's dedication to the doctors who did so much for him: "The doctor is the flower of our civilization and when that stage of man is done away with and remembered only to be marvelled at in history he will be thought to have shared as little as any in the defects of the period and most notably exhibited virtues of the race."

PEDIATRICS

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ORIGINAL ARTICLES

AN IRREGULAR MANIFESTATION OF MALARIA IN AN INFANT.

BY H. MERRIMAN STEELE, PH.B., M.D.,

NEW HAVEN, CONN.

American; male; age nineteen months.

Complaint—General prostration, restlessness, dyspnea, pain on handling and tumultuous heart action.

Family History—Negative (good).

Past History—Has been a strong, healthy baby. Breast fed seven months, followed by intelligent bottle feeding to diet at present time suitable for age. Development normal.

Present Illness.—July 10, 1903—Infant at Summer resort near New Haven. Yesterday and to-day have been exceedingly hot. While on beach this morning his nurse noticed him become very quiet and apathetic. He had been carefully protected from the direct rays of the sun. Taken to the cottage at noon for his mid-day meal, it was observed his appetite was lost and that he seemed generally prostrated. Fever was not noticed. He was kept indoors during the afternoon, but did not regain spirits or vigor. He grew, instead, more and more debilitated. About five hours later (5:30 p.m.) signs of dyspnea were manifest, with more active symptoms of general discomfort. He complained, on handling, as if pain in side ("stitch"), and mother then noticed a tumultuous heart action through clothing. Between six and seven o'clock the infant was probably in quite intense dyspnea, from description given at time of visit. The respiration, beyond being labored, was accompanied by a little distressed cry on expiration.

Visit.—9 a.m. (nine hours after onset)—Child in bed, restless and uneasy, lying on back, left leg now and then drawn spasmodically over abdomen; arms and hands moving constantly, with picking at bed covering (the carphology was learned later to be a habit from early infancy). The patient looks very ill; face flushed; expression distressed; perspiration in beads on forehead; temperature of skin, to touch, little raised about the head; trunk and extremities cool and dry; eyes dull, pupils small; photophobia marked; tongue clean; ears and throat negative; head not retracted; no rash; breathing very rapid (60), distressed, labored and noisy; *alæ nasi* active; auscultation and percussion of thorax negative; pulse 160, weak, thready, easily compressed and intermitting now and then; heart regular and strong, in marked contrast to pulse, although very fast, the sounds clear and sharp. Abdomen normal on inspection, but attempts at palpitation cause it to become rigid and makes the patient cry. At each attempt to palpitate the right leg is drawn up. No special area of tenderness found, the discomfort being no more marked in the appendix region than elsewhere. Doubt if crying is caused by pain; believe it rather manifestation of discomfort and disturbance through palpitation.

Although the skin over the trunk and extremities is cool and that of the head but slightly warmer, the rectal temperature is 106.2. The patient is in a state of semicoma part of the time, alternating with periods of symptoms pointing to convulsions—rolling up of the eyes, spasmodic drawing up of the legs, etc. There has been no vomiting or diarrhea.

In view of the fact that no temperature had been at any time noticed (up to time of visit) the low superficial skin temperature still persisting, the general prostration, collapse, restlessness, nervous symptoms and small, rapid pulse, a diagnosis of insolation (heat exhaustion) was made in spite of the high rectal temperature. A hot mustard bath, with cold water to the head, almost immediately relieved the dyspnea, quieted the nervous symptoms and brought the patient out of the semi-coma into which he lapsed off and on. Placed in bed, the infant fell asleep almost immediately. A simple fever mixture was left and small doses of alcohol (whiskey) ordered. The latter acted well in dilating the superficial blood vessels, showing the pulse and moistening the skin. I believe the alcohol gave this result more than the bath.

Condition Following.—July 11th—After a short sleep the child had a rather restless night; the dyspnea, however, did not return, nor did the convulsive symptoms. Breakfast was refused. A small stool was passed, which, saved for examination, was normal. Later in the morning some twitching of legs and arms was noticed, as well as rolling of the eyes.

Visit.—10:30 a.m.—Infant in mother's arms; uneasy, but not very restless; eyes now and then rolling up rather spasmodically. Patient sits up in mother's lap for few momnets, then cuddles down as if exhausted. Malaria-like rash on cheeks, none on body. Is thirsty. Skin moist; scalp and forehead covered with perspiration. Temperature (rectal) 103.2; pulse 140, better quality. Heart, lungs, abdomen and throat normal. Eyes dull. Patient very apathetic.

Treatment.—Calomel and sodium bicarbonate; sodium bromide.

The baby passed a restless, uncomfortable day until late afternoon, when he fell into quiet sleep. His appetite completely lost. On waking in the early evening he "seemed himself again." Temperature 102.4. Passed a good night. Three o'clock, wakened for movement. Stool, saved for examination, large, well digested, normal. Rest of night good.

July12th—Child improved in general appearance. Appetite, however, not returned. No muscular twitching. The rash noted yesterday on cheeks is now general over body. Beyond this, the general examination negative. He attempts to walk and play, but quickly tires. Temperature 103.4; pulse 120. Cool sponging ordered and bromide discontinued.

July 13th—Condition same, with the exception the rash has cleared up. A morning temperature continues, with fall in late afternoon. The patient sleeps a great deal, is drowsy when awake, apathetic, dull and irritable. No gastric nor intestinal symptoms have developed. Although nothing suggestive of a chill has been observed, the whole general picture of the child suggests malaria; the morning temperature and dull apathy especially. I consequently made a blood examination, to find typical parasites, although in very small numbers. Quinine (suppositories, quin. hydro. gms. 0.18 each t. i. d.) were given. As this form of medication caused discomfort, and as it was expedient to get the system under quinine as soon as possible, the bisulphate (gms. 0.24 to the dose, in water) was substituted.

Until the 16th (two days later) the patient continued a morning temperature, but each day the height of the fever was less. Two times it dropped to normal (16th)—once early morning and again the same evening. The dullness and apathy followed the course of the fever, but each day showed a slight change for the better. He did not, however, respond to treatment so readily as is usual when the infection is so early recognized and treated.

On the 19th (nine days after onset) he was well. Quinine was continued (one dose daily) to the 27th, at which time a slight indigestion occurred, the drug being vomited two or three times. For this reason the quinine was temporarily stopped.

During August the symptoms of dulness and apathy once manifested themselves for two days, but no fever developed, nor did any symptoms of the original attack. Quinine exhibited in small doses brought about a prompt recovery.

He is now, September 1st, taking small daily prophylactic dose, and is in excellent health.

The special object in reporting the above case is to urge the necessity of a blood examination in vague attacks with remittent or intermittent fever applicable to many disorders. In this particular case the finding of the plasmodium saved valuable time in instituting treatment. The lack of a leucocytosis threw out any consideration of septic processes to account for the fever.

As to the "therapeutic test" with quinine:

Koplik writes: "Its use before diagnosis (*i.e.*, blood examination) can result only in uncertainty, since there are rises in temperature, not due to paludism, which may be influenced by quinine."

Holt, however (urging, of course, the blood diagnosis first), places more weight on the test. He says: "Particular importance is to be placed on the therapeutic test. Recent experience emphasizes more and more strongly the fact that quinine has very little influence on fevers which are not malarial, and conversely, that a fever immediately and prematurely controlled by quinine is pretty certain to be malaria."

It the case reported five days passed before the temperature was permanently controlled by the quinine. As a test, then, it is apparent that the microscope and quinine are not to be compared, and, when one has access to a microscopic examination of the blood, an injustice is being done the patient shall that means of diagnosis be ignored.

TWO CASES OF INFANTILE MYXEDEMA[1]

By James Frederick Clarke, A.M., M.D.,
of Fairfield, Iowa.

There are no less than six cases of infantile myxedema, resulting in a cretinoid condition, in Iowa, and probably many more. Since the condition is frequently unrecognized, it is possible that the accompanying photographs of the two cases occurring in my practice may help to call attention to the value and importance of early treatment.

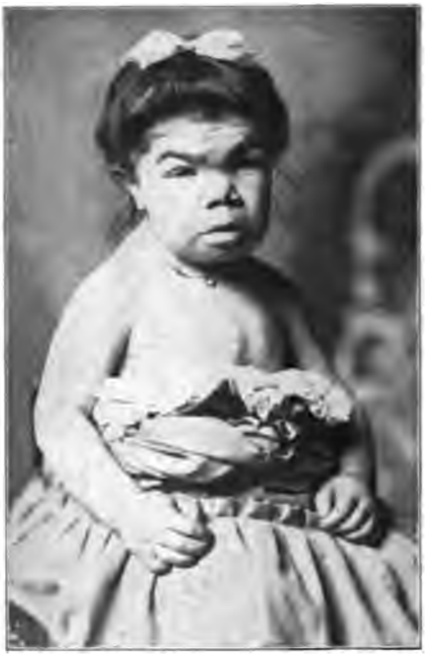
Fig. 1.—Case 1. E. M., age 20 years and 4 months, at beginning of treatment.

Case I.—E. M.[2] was first seen when 20 years and 4 months of age (Fig. 1). Thyroid feeding was at once begun. Improvement was rapid, even at this late age. In the first 18 months the increase in weight was 13½ pounds, and in height was 5¾ inches (Fig. 2). She now, at nearly 23 years of age, appears as a bright, active child of 7 or 8 years, with, since treatment was begun, an entire new growth of hair, new teeth and a normal soft skin.

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[1] For the privilege of reporting this case and for cuts we are indebted to the Editor of the *Journal of the American Medical Association.*

[2] Reported with early photographs in the *Medical Fortnight,* May 26, 1902.

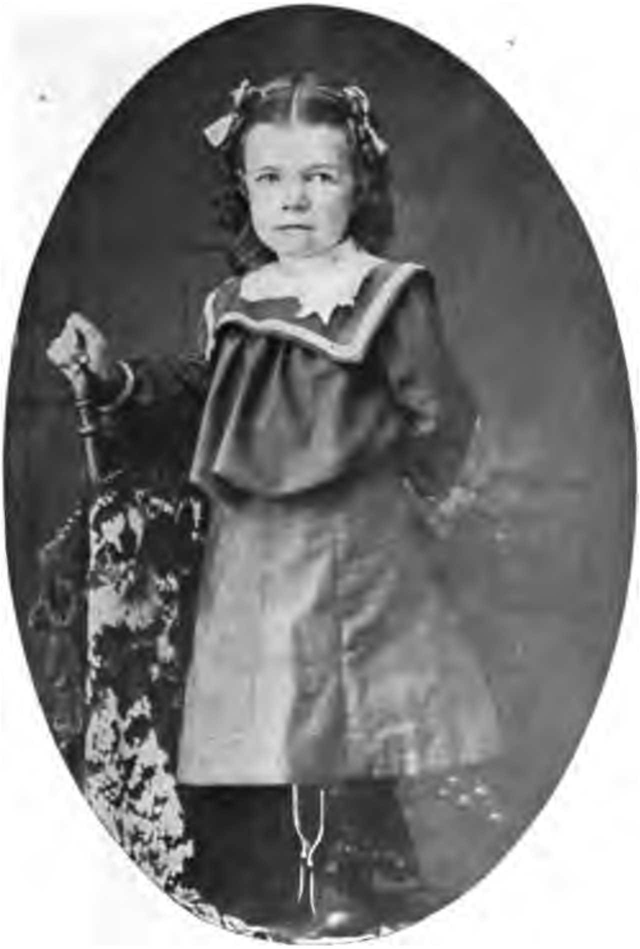

Fig. 2.—Case I. E. M., 21 years and 11 months, after one year and seven months' treatment.

Case II.—P. B., born in Iowa, was seen first when 8 years and 5 months of age (Fig. 3). Her family history was good. The mother gives the past history as follows: The labor at her birth was easy, no physician being present. The baby weighed 9 pounds. At two weeks' a "blood tumor" appeared on the forehead and grew to be the size of a walnut. At 4 months this tumor was removed under chloroform anesthesia. Whooping-cough was the only other sickness until she was weaned and began teething at 18 months of age. At 18 months she was "sick all winter," lying in her buggy all the time, and having a yellow color. Teething continued to the sixth year. She has never walked except by holding to chairs, and has never learned to

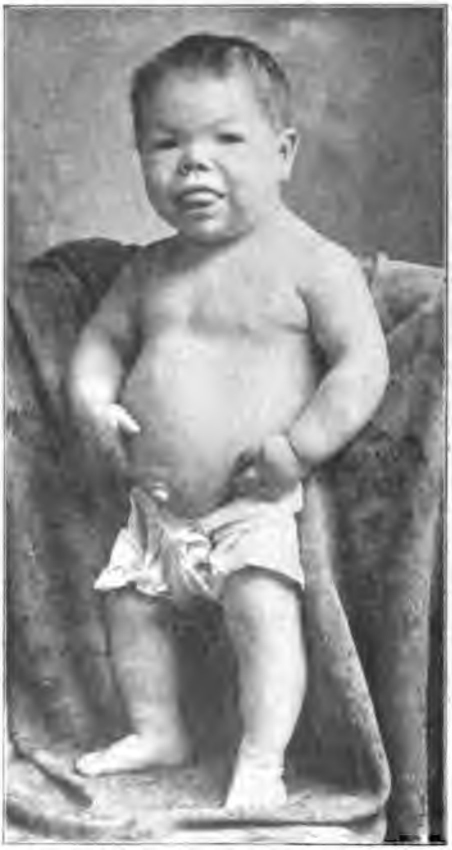

Fig. 3.—Case 2. P. B., age 8 years and 5 months, at beginning of treatment.

speak but a few words. She has had alternating diarrhea and constipation, and at time vomiting. Though always sleeping well, she eats very little, at many meals not more than two teaspoonfuls of food. She has never had spasms and the eyes have never been crossed.

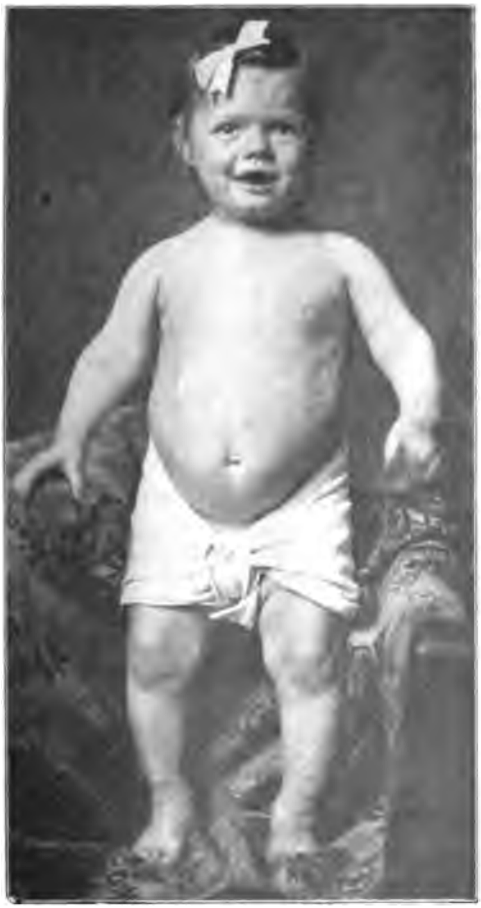

Fig. 4.—Case 2. P. B., age 9 years and 5 months, after one year's treatment.

When first seen, November 25, 1902, this child, 8 years, 5 months old, had the fontanelle open. The suture lines of the skull were depressed. The thick tongue protruded, and the saliva constantly dribbled from the mouth. The child would sit continually in an apathetic condition or would stand supported by a chair. The hair was coarse, the skin dry and wrinkled, and only first teeth were present. The abdomen was prominent, the legs bowed and the spine curved so that the chin rested on the thorax.

Thyroid feeding was begun at once. Beginning with one-half of one tablet after each meal, the amount was rapidly increased until two tablets were given three times a day. In two weeks she became brighter and more active. There was at first a loss in weight and then a rapid gain.

In one year from the beginning of the thyroid feeding, the gain in weight has been 14 pounds, and the gain in height 7¼ inches (Fig. 4). Two new teeth have appeared and her hair is all new and soft. She runs about, eats well and is learning to talk. The photographs show better than words the transformation.

A DISCUSSION ON THE CHARACTER OF MILK SUPPLIED TO CITIES.[1]

I. THE PRODUCTION OF SANITARY MILK FROM THE PRODUCER'S STANDPOINT.

By R. A. Pearson,

PROFESSOR OF DAIRY INDUSTRY, CORNELL UNIVERSITY, ITHACA, N. Y.

The improvement of the city milk supply is a question in which I am intensely interested and it is very encouraging to find such a representative gathering of persons in this city who have come here to listen to the discussion of this subject, which is supposed to be one of small importance, or at all events one which should be relegated to a comparatively few persons. Really it is a subject in which every one should be interested.

My paper takes up the subject from the producer's standpoint. There is much that I would like to say from other standpoints, but I have confined what few remarks I shall make to the standpoint of the producer.

One of the reasons why there has not been more advance in the movement for better market milk undoubtedly is that the question is too seldom considered from the producer's standpoint. People say "we should have purer milk," and they seem to think the producer should act at once upon the suggestion. Although they may go to great length to show *how* pure milk should be produced and handled it is seldom that they consider what this means to the producer. It is strange that this is the case because no improvement can be effected in the character of any article without the interest and co-operation of the manufacturer or producer. And when an attempt is made to work out the problem in such a one-sided manner it is doomed to end in failure.

There are at least four influences that are respected by milk producers and it may be profitable to consider them briefly. They are (1) Legal regulations, (2) Intelligent public opinion, (3)

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[1] This discussion was held last January in Albany. The importance of the relationship of the problem of a milk supply to infant food is evident, and the Editor of Pediatrics, in using this material, acknowledges his indebtedness to the *Albany Medical Annals.*

The example of high class dairies, and (4) Endorsement by responsible persons.

Reasonable and well-enforced laws and ordinances are not objected to by well-meaning dairymen, as they see the advantage of suppressing undesirable practices. Carefully compiled data show that in towns where the milk regulations are strict and well enforced, the average per capita use of milk much exceeds the same in towns where it is known the authorities are doing little to protect the milk supply. In Rochester, New York, where about four thousand dollars are expended annually for the supervision of the milk supply and a few thousand milk samples are examined both chemically and bacteriologically each year, the average daily use of milk amounts to about eighty-three one-hundredths pint per capita; while in St. Louis, Missouri, where less than two thousand dollars are expended annually for the supervision of the milk supply and only a few hundred samples of milk are examined chemically and bacteriologically, and where it is officially admitted that the milk regulations are not well enforced, the average daily use of milk amounts to only about thirty-seven one-hundredths pint per capita. Just and well-enforced laws are not objectionable. They increase public confidence in milk and thus increase the demand for it. It would be well to add here that by "well-enforced" we mean enforcement by an officer who is in sympathy with all honest efforts to improve the milk supply and who does not labor under the belief that all persons engaged in producing or handling milk are necessarily by nature law breakers. There are in office a few persons of this latter class, and it may often be said their work is useless or worse than useless, regardless of the character of the law they are called upon to execute.

Dairymen would welcome an extension of the laws so as to stop a certain kind of dishonest competition practiced by a few which results in greatly retarding the advancement of the industry—the making of unwarranted claims regarding the quality of milk offered for sale. Those who go to the trouble and expense of equipping and conducting their dairies in such a manner as to greatly reduce the bacterial contamination of their milk and proceed to advertise this fact for the purpose of gaining trade, have a just grievance when unscrupulous persons come forward with the dishonest claim that they, too, are exercising the same care in all respects, and offer to sell their milk at a price for which it could not be sold if produced as asserted. It may be said that the same is true in respect to all commodities. It is; but to a much less extent than in the case of milk. Generally the quality of an article is more or less evident, even to the casual observer. But the quality or wholesomeness of marketable milk cannot be known from its appearance. Probably milk can be adulterated or contaminated to a greater extent than any other food product without causing a change in the appearance. This fact, in connection with the fact that milk is generally used raw and it is depended upon for nourishment, particularly by those in greatest need of pure food, should be reasons enough for taking measures to lead to the improvement of the milk supply that might not be resorted to with other foods. There is nothing so discouraging to the man who tries to market high grade milk as competition of the kind referred to. He can compete with milk produced in an ordinary manner and sold at a lower price, but it is most discouraging to have to compete with that cheap milk when it is loudly proclaimed to be produced with care that was never exercised. Some time ago the Keystone Veterinary Society of Philadelphia carefully investigated a number of dairies that displayed prominently such signs as "Hygienic Milk," "Veterinary and Sanitary Inspection" and the like. It was found that these statements were first used by persons who had some good reason for using them, although they had no right to do so. Some of these latter did not even know the meaning of the words they used. Some claimed to be their own sanitary inspectors. Some frankly acknowledged their dishonesty. It would seem that a legal method could be devised for checking such reckless and harmful advertising.

Dairymen would welcome also the enactment of regulations regarding the care of milk bottles when in the possession of the customer. The neglect and abuse to which these milk vessels are subjected by some persons are shameful. The case is like this: The dairyman or dealer goes to the expense of providing the most sanitary and expensive milk package available. Many of these are appropriated for various household purposes; many are broken. Many find their way to the ash dumps, but some of these are finally picked up and returned to their owners. The losses on these accounts are very heavy, some estimate that the average life of a bottle will not exceed seven deliveries. But the worst of all is the condition of many jars when they are returned to the dairyman or dealer. Much good might follow the enactment of an ordinance requiring the proper care of milk bottles and their prompt return except when they have been exposed where a contagious disease exists.

Public opinion was mentioned as an influence that would be respected by dairymen. If the public should insist upon having a better grade of milk than it now gets, improvements would be made very quickly, but the fact is there is little general complaint about the character of our market milk. Many persons do not use milk because they have been unsuccessful in finding a satisfactory supply, and others use as little as possible for the same reason. But only a few of these are making efforts to procure good milk, thus bringing to bear pressure for a better supply. Occasionally a little general interest in the question is aroused, but it quickly subsides. The great demand is satisfied with milk that is not sour and that contains a fair proportion of cream. Little stress is placed upon the importance of having it clean. As a rule the consumer shows absolutely no interest in the sanitary condition. All milk looks alike and tastes alike to most people whether it was produced under sanitary or unsanitary conditions, and these matters are not considered. A most remarkable feature of the case is the position or lack of position taken by institutions buying on contract, especially hospitals. As a rule these institutions buy their milk without stipulation as to sanitary quality. To the average consumer and dairyman this is proof that the present milk supply is good enough. They say it must be good enough if it is used in institutions established for curing the sick and often seemingly spending money without stint in whatever way it is believed such expenditures will be of benefit to the sick. Naturally in all matters of health the public looks to physicians and to institutions conducted by physicians for example. When they see care being taken in these quarters in the selection of milk then will they themselves take more care. Unquestionably one great reason why there is not more sanitary milk produced to-day is that there is not more demand for it. Well-to-do and responsible dairymen are to-day sending to the city milk of average quality and they would be glad to make the few necessary changes in equipment and management of their places to enable them to produce high grade milk if they could find an outlet for it at a sufficiently advanced price to pay the increased cost of production. Unfortunately few wholesalers want such milk because few retailers want it, and few retailers want it because few of their customers call for it.

The example of well-conducted dairies was mentioned as an influence toward better milk. It is a strong influence. Along with their other benefits, such dairies have the effect of educating the public and they have done much in this way. When they have been well conducted and have persisted, through more or less serious temporary difficulties which seem bound to occur with most plants of this kind, they have almost always flourished. And it is a noticeable fact that at other dairies, especially those nearby and competing, there is a decided tendency toward improvement.

The fourth agency working toward better milk is the Milk Commission. Several years ago I was strongly of the opinion that by this means much would be done toward the improvement of our market milk. I am still of the same opinion, and think this is justified by present conditions. A few Milk Commissions are in operation and doing good work. The results of their work which can be exactly measured sometimes seems small, but when we remember that the idea is a comparatively new one and compare what they are doing to-day with the conditions of twelve or fifteen years ago, it is seen that much has been accomplished. Sometimes the Commissioners are criticised as being too far in advance, but persons who take this position overlook the good effects of their work as an educational agency.

There is no doubt but that dairies not known to the Commissions are benefited by them; certainly the public is being slowly educated. It is probable that the Commissions should be better supported in some cases, especially by physicians who most appreciate the value of their work. It is possible also that they might in some cases properly give more encouragement to the dairies they control. The theory that the best dairies should be supported is a sound one. One of the first reasons is that this removes to a large extent unfair competition, such as has been mentioned. Another reason is that the average quality of market milk can be raised as well by encouraging the good as by punishing the bad. Of course, also, we should add that for their own information physicians should take steps to learn which are the most reliable dairies.

We have mentioned four of the influences for better market milk. All of these are forcible, but no one will have the force it should have unless there is a willingness on the part of the purchaser to pay a fair price for quality. We know what it means to produce milk in such a manner as to exclude unnecessary contamination, and it is not necessary to rehearse here the many details that must be looked after when contamination and fermentation are being reduced to the lowest practicable limit. They may be summed up in the words cleanliness and low temperature. Any dairyman within easy reach of a city can market his milk at the regular market rate without exercising unusual care in its production and handling. It is not natural to think he will increase the cost of his operations unless it is made profitable to do so. It is, of course, to his own interest to have a sanitary stable, healthy cows and to use wholesome feeds, but he should not be expected to keep his cows scrupulously clean, discard foremilk and sterilize utensils unless he is paid for doing these things. One-half to one and one-half cents additional per quart would cover the cost of many desirable improvements. A campaign for better milk, therefore, should have a special department charged with the education of the public as to the increased value of better milk. I believe the dairymen will be found ready to respond to a demand for sanitary milk accompanied by a willingness to pay for it.

II. THE PRACTICAL SIDE OF THE QUESTION OF MILK SUPPLY.

By Charles Harrington, M. D.,

ASSISTANT PROFESSOR OF HYGIENE, HARVARD MEDICAL SCHOOL,
BOSTON, MASS.

In the preliminary notice of this meeting I observe that it is stated that I am to speak from the standpoint of the chemist, but, inasmuch as my connection with milk supplies has been more in the line of control than of their normal chemical composition, I shall avail myself of the privilege, expressed in my invitation from Dr. Pearce, to take rather the practical side of the question.

The importance of a supply of clean, pure milk is so universally understood by the medical profession that its discussion here would be a waste of time, for it is conceded that, from the standpoint of economy and nutrition, it must be free from adulteration, and from that of the public health, that it must be clean. To secure such a supply requires continuous care and hard work. It cannot be acquired suddenly, but must be the result of agitation by the profession and of more or less necessary coercion of those who produce and distribute it.

So far as I am aware, the history of all large public milk supplies is the same, up to the time when official supervision begins in earnest and the dealers and producers realize the fact. Then we observe an improvement in its nutritive properties in direct proportion to the extent to which punitive measures are enforced, and this obtains so long as the public authorities are active and no longer; for relaxation of enforcement of the law is followed at once by a return to pre-existing conditions. The stamping out of fraudulent practices is usually, and, indeed, almost necessarily, the first step to be taken, and when attention must be turned to improvement in the matter of handling and distribution so that the supply shall be clean as well as pure; and this is by far the most difficult part of the work, for it necessitates education of the public, the adoption of strict rules which must often involve some personal hardship, and the enjoyment of a staff of assistants, which, under the usual conditions of municipal administration, it is difficult to secure.

To illustrate what the securing of a proper supply of milk involves, let us take the case of a city of any considerable size, in which either no control or inefficient control has been exercised. Examination of a few hundred samples gathered hap-hazard will show that the great majority are adulterated in one or more ways; if not watered, they have been robbed of more or less of their fat; whether watered or skimmed, or both, many are colored with annatto or caromel or aniline dyes, in order that they may appear to be of good, rich quality; a fairly large proportion, even of those not otherwise adulterated, contain chemical preservatives, notably borax, boric acid and formaldehyde, introduced to obviate the use of ice and to enable the dealer to dispose of his stale stock. In years gone by, when the laws governing the inspection and sale of milk began to be enforced in Massachusetts under the leadership of the State Board of

Health, it was not an uncommon thing to find evidence of all four forms of adulteration in the same sample.

Then, let us suppose, the authorities of the city of which we are speaking determine that such things shall not be. They appoint an inspector, give him a working staff and a proper appropriation, and tell him to enforce the law without fear or favor. If he is in earnest, his troubles begin at once and come from all sides. He begins by haling a number of offenders to court, and at once arouses the enmity of all of the bad element in the trade. The cases are defended by able attorneys and every obstacle possible is placed in the path of conviction; friends of the accused try persuasion and threats; appeals are taken to higher courts, and the law itself is put upon trial, until every possible technical question has been passed upon by the court of last resort. In the meantime he is accused of discriminating against this man and favoring that one; more than likely it is whispered that his salary is but a small fraction of his income and that he is amassing wealth beyond the dreams of avarice. He receives anonymous communications containing threats of bodily harm and, worst of all, confidential information that his most trusted lieutenants are receiving bribes from certain specified individuals and syndicates. This, indeed, causes him some worry, for he realizes that, if it be true, his own honor is at stake. Thus he must watch both his enemies and those to whom he looks for honest co-operation. If he is influenced by threats or by persuasion, and, more than all, if he lays himself under any obligations whatsoever, he and his cause are lost; but if he pursues his course without fear or favor, stands by his men when they are right and dismisses them on the slightest proof of unfaithfulness, he cannot fail to win, assuming, of course, that he has the support of his official superiors. The curve of improvement, which, for a time, deviates but little from the horizontal, takes at least a sudden upward direction and then gradually attains its maximum height. Having accomplished this result, he cannot relax, but must continue to keep a tight rein so that his curve shall not begin to descend. He finds that whereas adulteration was formerly epidemic, it is now sporadic. Occasionally an acute exacerbation occurs, owing to inequality of supply and demand; but he applies the remedy, and order is again restored.

Having stamped out the extensive practice of adulteration so far as is possible, for an absolutely pure milk supply is as inconceivable as an absolutely moral community, he can now devote a larger measure of attention to the subject of a cleaner product; that is to say, to the problem of reducing the bacterial content by improved conditions at the farm and better methods of handling, storage and distribution. The enormous influence of ordinary stable filth and dust, of uncleanliness of vessels, and of high temperatures in the rapid increase in the bacterial content has been demonstrated repeatedly by Freeman, Russell, Park and others, who have preached the gospel of cleanliness to the profession and to the public without ceasing.

Naturally, he looks to the public for sympathy and support, for it is the consumer that suffers from the results of uncleanliness; but so far as my own experience teaches, he looks in vain. Viewed as an academic question, the problem of clean milk meets with approval; but when it is approached practically, interest wanes and soon disappears. One would suppose that the layman, to whom the words "germ" and "bacteria" are associated only with disease, would revolt at the idea of receiving milk containing billions of these organisms to the pint; but if he does, it must be in secret. I do not know what the conditions of delivery here in Albany may be, but I can well believe that they are much the same as with us in Boston, where, for the increase in the number of bacteria per cubic centimeter after the milk reaches the city, the public is largely to blame. It is thus: The consumer has become accustomed to receiving his daily supply in the very early morning hours, the vessel or vessels containing it being left on the doorstep or in a box provided for the purpose. He prefers it in glass jars, which are more attractive than tin cans and more likely to be clean. When he takes it in from the outside the cream is standing at the top and he can pour off that which he needs for the coffee and the inevitable breakfast cereal. It came before he was up: it is fresh from the cow: and he is glad. But, as a matter of fact, it is nearly a day older than it was when it reached the city, for it arrived at perhaps seven, eight or nine o'clock the day before—too late for early morning delivery—and was carried to a stable, where it was poured out of the tin receptacles in which it made its journey, into the glass jars provided for family use. Then it is stored in an ice chest, which is not always kept scrupulously clean, and at the proper time it was loaded on to the wagon and distributed. Suppose the milkman were to say to his customer, "If you will let me bring you milk at 10 o'clock in my large cans and let me measure it directly into your own pitcher, it will be better for us both," what would be the probable answer? I venture to say that if he announced his intention to deliver it at that hour, he would soon have no so-called family trade. His customers would leave him in squads, because they want early delivery and cream at the top. The same result could be achieved by storing the milk in their own, probably cleaner, refrigerator, but they would be conscious the next day that they were using "yesterday's milk." Here is where education is necessary, and I can assure you that progress will be usually pretty slow. And it is education of the intelligent well-to-do, not of the ignorant poor, that is required. The latter class is somewhat more fortunate in its milk supply; one of the few compensations of poverty. The ignorant poor are obliged to buy as they need it. They have no credit and cannot have a milk score; they have no storage room and perhaps no ice; they buy at the grocer's and at the bakery, and these establishments are using, in part, at least, milk delivered directly from the cars, or the *to-morrow's* milk of the family trade.

In still another way the consumer shows his languid interest in clean milk. A. B. maintains a model dairy. His cows are washed and groomed, his milkers are dressed in clean linen, his vessels are sterile; no stale milk is permitted on the premises, the unsold balance being disposed of in some way each day; his delivery wagons are neat and clean and driven by respectably dressed "strikers." The care which he gives to cleanliness requires additional hands, and his expenses are therefore increased; but the addition of a single cent to the price per quart will take care of that. He is assured by enthusiastic friends that he has a gold mine; everybody will want his milk. And so they will, but not at an increased cost. That extra cent cools the interest in clean milk, and soon he is making butter of his surplus.

It may be taken for granted that the initiative in the matter of clean milk must be taken by public authority with the co-operation of the medical profession. The public, as a whole, can, I think, be left out of account, for it is indifferent to its best interests and must be saved in spite of itself.

The first question is, How shall be ensure the public against the consumption of milk rich in bacteria? Now, there are two ways of producing milk with comparatively few organisms per cubic centimeter, namely (a) by subjecting those already present to the destructive influence of heat—i. e., by pasteurization or sterilization, and (b) by preventing their growth from the beginning. To those who have observed the not uncommon untoward results of feeding infants on sterilized or pasteurized milk, the method first mentioned does not commend itself for general use. Moreover, practically the same result can be attained by other means, which involve no special outlay, and the milk suffers no deterioration and contains no undesirable bacterial toxins.

We must begin with cleanliness at the place of milking. Professors Russell, Freeman, Park and others have given us interesting figures showing the advantage of clean milking and the very great difference in bacterial content when cows are milked in the open air rather than in dusty barns, and when their udders and adjacent parts are clean rather than dirty. A very small amount of fecal filth per quart of milk makes a very great increase in the number of bacteria per centimeter. Thus, it has been shown that with one-tenth grain of stable dirt per quart one may expect about three and one-third millions of bacteria per cubic centimeter; with one-third grain the number rises to more than seven millions, and with little more than a half grain it rises to nearly thirteen millions. From quantitative determinations of the amount of stable dirt in many samples of milk, it has been estimated that Berlin consumes every day no less than three hundred pounds of cow dung with its milk, and what is true of the Berlin supply is probably applicable to that of any large community.

Some years ago I made a tour of inspection among the nearby dairies which sent their product into Boston, those within the city limits having already been inspected and kept in order by our efficient Board of Health. The conditions found to obtain were, in many instances, about as unsanitary as can be imagined. Filthy barns, occupied by filthy cows which were milked by filthy men, were the rule rather than the exception. In many of them the cans stood on the manure piles, ready for filling; the stoppers were in boxes or baskets, or in piles on the floor. Farther away, in the less thickly settled districts, the conditions found were incomparably better, but at the same time there was much room for improvement.

If the conditions which exist in the country can be changed for the better, much of the problem of securing a clean supply for the consumer is disposed of; but not all, for we still have to deal with the middleman and the retail shopkeeper, whose storage facilities are not always, or even usually, of the best.

Shortly after my tour among the dairies, our Board of Health established certain regulations concerning the production, storage and sale of milk. Blanks were printed to be filled out by the milk producers, setting forth the cubic air space per cow, the general conditions of the barns, the location of manure pits, milk rooms, privies, etc., etc., and such other information as was relevant. The milk contractors were asked how many of these blanks each would require for the districts covered by their contracts, and they were directed to have them filled out and returned. The number necessary was found to be upwards of five thousand, and when it is stated that the dairies are scattered over a territory which includes parts of all six of the New England States, it may readily be understood that official verification of all of the returns is absolutely beyond the bounds of possibility. With few exceptions, the reports showed an amazing unanimity in recording excellent sanitary conditions; but each producer was doubtless the judge of his own premises. It was evident that no good could come from this course of investigation, and the project of requiring annual reports fell into abeyance.

But within our own territory rules could be framed and enforced, and each applicant for a retailer's license was subjected to an examination concerning the condition of his premises and his facilities for proper storage. Before a license was issued, his answers, if favorable, were verified. If they were unfavorable, or if found to be in an unsanitary condition or the dealer violates the regulations concerning storage, the license is revoked.

But still we do not, and, under present conditions, we cannot have clean milk, and further and more strict regulations are now under consideration and will shortly be promulgated. We cannot hope to educate the producer and the retailer by ordinary means, but we may succeed in education through the pocket. A reasonable bacterial standard will be established and milk not conforming thereto will be barred from the market. The producer or retailer who finds that his milk is contraband will, it is thought, take the necessary steps to make his merchandise salable and gradually the question of cleanliness will be solved.

THE NECESSITY FOR THE ANNUAL SYSTEMATIC EXAMINATION OF SCHOOL CHILDREN'S EYES, EARS, NOSES AND THROATS BY SCHOOL TEACHERS.[1]

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There are in the United States over fifteen million school children, ten million of whom are suffering from some eye, ear, nose or throat defect, which if relieved will place them in much better condition to undergo life's struggles, and to achieve a measurable degree of that success which produces self-respecting citizenship, and relieves the State, county or town of burdensome pauperism. No flight of fancy is required to transform the defective child into the non-supporting "ne'er do-well," the wandering and menacing tramp, or the idle, pleasure-speaking and misery-finding prostitute. The evolution is natural and consequential, and stands as an enduring monument to the benignity of education. A child whose educational progress is embarrassed or almost stopped by reason of physical defects may soon acquire a loathing for education and all that education represents, and the seeds of idleness and irresponsibility thus being sown, may, unless energetically and tactfully controlled, either by parental or surrounding influences, fructify and produce a personality ripe for sinister inoculation. If, therefore, the State can eliminate, control or mitigate the existence of such physical defects in children, and by its parental supervision place such children in a position of reasonable equality with their healthy companions, thus affording them fair opportunities for educational progress, its duties become unmistakably clear, and its investment of public funds for the consummation of such designs a laudable measure of unquestionable economics. If the direct causes of criminality and pauperism could be accurately ascertained, I will venture the opinion that the prevailing etiological factors would be physical defectiveness and social surroundings. If, therefore, either of these can be even materially mitigated, a distinct impression would be made upon criminal and pauper annals, and the problem would become one to be worthily considered by the economist, philanthropist or sociologist. The improving of either physical defects or social surroundings in adult life is a problem of almost hopeless perplexity, while if these foes to racial prosperity be attacked in the budding periods of human existence, the difficulties are immeasurably mitigated.

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[1] Read before the Indiana Board of Health School held at Indianapolis.

Concerning the last of these mundane misfortunes, or the social surroundings of individuals, this paper will have nothing to say, but as a medical man, I am intensely interested in the second proposition referring to physical defectiveness, and I sincerely believe that if the relievable bodily abnormalities of children could be eliminated a mighty factor encouraging idleness, poverty and crime, to say nothing of human suffering, would be driven forcefully to obscurity.

"Prevention is better than cure" is an old adage, and is nowhere more truthfully exemplified than in the subject under consideration. The adage might be somewhat altered to read, "Prevention is possible a thousand times, while cure is possible but once," and still not stray very far from the truth. So true is this, that almost all great reform and philanthropic movements tending toward the physical, mental, moral and sociological uplifting of humanity, are surely and inevitably endeavoring to grapple with the subject in the earliest years of childhood, before the withering and decadent breath of human degeneration has rendered upward and improving conditions well-nigh impossible.

Perhaps nothing more surely indicates the nobility and unselfishness of the medical profession than its recognition of these principles, and its beneficent work in the direction of preventive hygiene and medicine. Its best efforts are directed toward the elimination of disease, thus presenting the only instance in professional or commercial life where strenuous efforts are made to destroy one's own income. While it would be most interesting and instructive to dwell upon the various bodily infirmities of children that militate against their intellectual, moral and sociological advancement, the space allotted for this paper is all too short to permit of such a digression. The title of my paper indicates that I have come to speak to you upon those ocular and aural defects which deter or prevent the afflicted child from acquiring those educational advantages which properly equip him for the great battle of life, the struggle for existence.

Come with me to the clinic and see a poor child of perhaps some foreign extraction. Notice its attenuated form, its pinched countenance, its bloodless, ill-nourished appearance, its unintelligent, unresponsive aspect, all indicating insufficient nutrition before and after birth, and general lack of proper food, air, care and hygiene during the brief span of its miserable existence.

Examine its eyes with your test-types and ophthalmoscope, and you will perhaps find myopia or hypermetropia of enormous degrees, or a congenital cataract; either doubtless due to pre and post-natal starvation and general neglect. Place this child in a school where physical defects are unrecognized and watch the results. He is unable to see distinctly, and headaches, pain and general discomfiture follow all his efforts at study. He cannot even see the blackboards and charts, and printed books are indistinct or seen with much effort, the faces of his teacher and comrades are blurred; he does not know what is the matter, but he finds it impossible to keep pace with his fellows, and he acquires a hatred for school; his endeavor to acquire an education becomes abortive; he falls behind his class, becomes discouraged and truant, and finally gives up the effort, joins the ranks of street gamins, develops criminal tendencies, is sent to a reformatory that does not reform, and may easily end his life in the penitentiary or on the gallows.

Pass from this defrauded child to another of similar miserable appearance, but with an unusually stupid countenance, produced from enlarged tonsils or adenoid tumors in the throat, which prevent proper nasal breathing, and cause him to keep his mouth open in order to breathe. Eventually he becomes deaf, either through obstructive and catarrhal influences or on account of chronic middle-ear suppuration, which is an actual and constant menace to his life. His general open-mouthed, unintelligent countenance, coupled with his deafness, lead him to be considered stupid, if not idiotic, an impression which is daily strengthened by his poor educational progress, impossible to overcome, through his unfortunate physical deformities. Eventually he, likewise, neglects his studies, hates his school, becomes a street habitue, idle and dissipated, and may easily terminate his existence amid crime and its consequences. These are no fancy pictures which I have painted in lurid hues for your delectation, to point the moral of my theme. They are true, living, breathing, pulsating facts that must be familiar to every student of hygiene, criminology, or sociology. If education is worth anything in the broadest sense, and if it passes beyond the borders of dilettanteism into the broad realms of those influences which stand for human uplift, then it should reach down, down to the very dregs and bottom of the social scale, and pull up the most unfortunate of the human race, and place them on a par with their fellow-men. You and I both know that education will perform this great evolutionary process, and I claim that it is the inalienable, in-born right of every citizen of this great, magnificent republic to be placed in a position where an education may be acquired. I also claim that in as much as we must look to education to solve many of the criminological and sociological problems of the day, and that the more knowledge is diffused throughout the length and breadth of this land, the happier and better will the land become; that it is the distinct, moral and economic duty of the state to see that educational advantages are afforded wherever such conditions are in anywise possible. I further believe that wherever obstructions exist blocking the way toward educational acquirements, they should, as far as possible, be dissipated by those guardians of the public welfare having such matters in charge. I believe that public school officials should maintain a strict surveillance over the physical as well as over the intellectual and moral welfare of those children committed to their charge. A large portion of a child's life is spent at school, and teachers should, and I believe, do take a sincere and watchful interest in the bodily condition of their pupils. The necessity of such observation is the more accentuated, because a large proportion of such children come from homes of ignorance, filth and vice, where mothers and fathers apparently care but little for their offspring, and evidently desire to shirk all possible moral responsibility. Under such circumstances the burden should fall upon the shoulders of the state authorities, both medical and educational, whose best endeavors should be taxed in vicariously officiating as both father and mother to those poor unfortunates whose earthly advent has been signalized by distress from birth to older years.

While it is not my intention to unduly magnify or exaggerate the importance of any particular physical defect, and its baneful influence in hindering educational acquirements, I believe it safe and conservative to declare that aside from mental capacity, nothing is so essential to intellectual progress as sight and hearing, and of these the former must claim the principal position. It is therefore to these two functions of special sense that particular reference will be made in this paper, and while I will not burden you with a large and formidable array of statistical truths that are now so well understood as to render recapitulation unnecessary, I will trespass upon your time and patience for a brief space of time in order to clarify in your minds, and the minds of others, the history and motives for the tests, a detailed description of which will be given toward the close of this article.

The examination of school children's eyes by regularly appointed ophthalmologists is no novelty. It has been done many times by numerous workers, and conspicuously by Cohn, of Germany, and Risley, of Philadelphia. The plan of ocular inspection by ophthalmologists, however, while ideal in theory, possesses the disadvantages of the great and unnecessary expenditure of public funds and the inevitable production of much professional friction. Concerning the first objection: it must be apparent that competent medical men could hardly devote such large amounts of time to annual investigations of this nature, which would practically consume the time of several men in large cities, without at least some compensation, which would necessarily add materially to the school budget, and certainly incompetent men would be undesirable. Relating to the second objection bearing upon the production of professional disturbance and friction, should one or several ophthalmologists be selected to personally examine all the public school children in a given city, it can only be said that such conditions would be but natural and human. The power thus placed in the hands of one man, or several men, would be enormous, and the opportunities for personal aggrandizement and gain, professionally and financially, so great that but few men could successfully withstand the temptation. It seems unnecessary to dwell at length upon this point, but to physicians who understand such matters throughout their devious and diverging pathways, the objections to the plan of personal inspection of all scholars by practicing physicians seem almost unsurmountable.

I, therefore, February 6, 1895, in a paper read before the Minnesota Academy of Medicine, proposed a plan for the annual systematic examination of school children's eyes by school teachers, which was shortly after placed in operation in the public schools in Minneapolis, St. Paul and other Minnesota cities. December 30, 1897, I read a paper before the Associated Minnesota School Boards, in St. Paul, in which I proposed that not only the eyes of school children should be annually examined by school teachers, but that the ear, nose and throat should be also examined through the agency of a few simple, pointed and pregnant questions and observations. This paper was supplemented by another, which I read April 9, 1898, before the Chicago Teachers' Club, in which I introduced a new testing card, combining in convenient form not only the Snellen test letters, but also minute and explicit directions to teachers as to how the tests may be made. The salient features of the test are that they shall be systematically performed each fall by school teachers. I say "systematically performed," because they should be made as regularly as any other school function, as otherwise their efficacy is almost lost. Many teachers imagine themselves to be enacting their complete duty when they maintain a general supervision of their pupils' ocular and aural conditions, observe palpable defects and occasionally refer their pupils to certain medical advisers. This is good as far as it goes, but it is totally inadequate as a substitute for carefully arranged questions that, when answered, will disclose the existence of 90 per cent. of serious eye, ear, nose and throat diseases. The occasional superficial and unsystematic observation of pupils' eyes and ears cannot be safely substituted for thorough, stereotyped tests that have been thoughtfully and intelligently framed for the detection of disease; and yet many ignorant but well-meaning teachers feel that comprehensive annual tests are entirely unnecessary, forgetting the fact that while conspicuous departures from health may be evident to a casual observer, many serious but hidden conditions are only detected by minute and careful examinations. Besides this, unless the tests are distinctly expected from each teacher, many children will escape thoughtful observation of even the most limited character, for while most teachers take a deep interest in their scholars, and conscientiously endeavor to promote their interests in every way, intellectually and physically, still teachers are frequently seen who regard their profession lightly, and endeavor to get through each day's work with as little personal effort as possible. Under such circumstances. it is certainly too much to expect that much time will be given to the investigation of the physical condition of pupils, and the child is, therefore, nearly as much neglected, or subjected to nearly the same degree of lack of intelligent supervision, as can be found in many of the squalid homes of public school children. The tests, therefore, should be uniform and systematic, and should annually include all pupils above the first grade, as it has been found impossible to satisfactorily examine quite young children. Some teachers have the impression that a child needs only one examination, but inasmuch as eye, ear, nose and throat diseases may develop from year to year in previously perfectly healthy children, it is essential that each annual test shall include all children above the first grade. The tests should be made early in the fall of the year, and should become an integral part of the regular school curriculum. By making the tests shortly after the opening of the fall term, the physical condition of pupils is early ascertained, and steps can be taken toward the correction of any existing abnormalities. Should parents be warned of the presence of physical defects in their children, and fail to act upon such warning, the teacher will have ample opportunity to counsel child and parent concerning the necessity of a medical consultation, which would hardly be possible if the tests are postponed till the close of school in the spring of the year. Besides this the fall tests will have the advantage of enabling the teacher to co-operate with the physician, in the execution of his advice, and to observe the results of treatment in the afflicted children.

Some objections have been raised to the examinations being made by school teachers, some feeling that parents would object, others that teachers are incompetent, and still others that it is an unjust tax upon the time and energy of the teachers. Concerning the first of these objections: its triviality is almost sufficient for its dismissal, and it need only be said that the tests are absolutely harmless and painless, that no instruments or appliances are used, and that the child is practically not even touched during the examination. Should any child or parent object, however, acquiescence to their wishes should be observed, as compulsion is undesirable, and clashing with parental authority should always, if possible, be avoided. Concerning the incompentency of teachers, I have only to say that anyone who is competent to be a teacher can make the tests with perfect ease. They are absolutely simple and uncomplicated, consisting of such questions as "Does the pupil habitually suffer from inflamed lids or eyes?" "Is the pupil probably 'cross-eyed'?" "Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's test types with either eye?" "Does matter (pus) or a foul odor proceed from either ear?" "Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room?" etc., etc. The ascertaining of simple facts of this nature does not require a medical education, and can easily be encompassed by anyone of ordinary intelligence and tact, and strange as it may appear, correct replies to the nine questions specified in the examination instruction will disclose the existence of at least 90 per cent. of serious eye, ear, nose and throat diseases. For instance, the question, "Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's test types with either eye will disclose the existence of myopia and many cases of hypermetropia and astigmatism. It will also detect cataract, corneal opacities, optic neuritis and atrophy, many diseases of the vitreous, retina and choroid, etc., etc. The question, "Does the pupil habitually suffer from inflamed lids or eyes?" will detect inflammatory diseases of the cornea, conjunctiva, lids, sclera, iris, etc., etc. The question, "Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room?" detects all forms of deafness, whether due to ear-wax, catarrh, labryinthine or middle ear disease, etc. The question, "Is the pupil an habitual mouth breather?" discloses turbinated and septum diseases, polypi, adenoids, enlarged tonsils, etc.

It will, therefore, be seen that notwithstanding the extreme simplicity of the questions, they are most comprehensive in their character, and are capable of detecting a vast majority of serious eye, ear, nose and throat diseases, and while the teacher cannot, and should not, attempt to make a diagnosis of the pupil's malady, she will at least know that something is wrong, and this is quite sufficient; the physician consulted will do the rest. In case some abnormal condition is disclosed by the tests the teacher sends the parent a card of warning, stating that some disease is believed to exist, which is not only unfortunate for the child, but will retard the progress of education, and advising the parent to consult the family physician or some specialist, either at the office or free dispensary. It will thus be seen that there is absolutely no reason why an intelligent teacher should feel at all incompetent to make these tests, and it is earnestly hoped that this objection will be now relegated to obscurity.

Concerning the objection to these tests on the ground of its being an unjust tax upon the time and energy of teachers: I have only to say that if the tests are made according to my instructions, this objection is quite as valueless as the others to which reference has just been made. Some years ago, when the tests were first introduced, the school principals personally performed the work, which, when it is remembered that in many of the city schools there are perhaps 2,000 scholars, became quite a burdensome and protracted labor. I now advise that each teacher examine the pupils in her or his own room, and as there are rarely more than fifty children in a room, the extra work imposed is certainly quite inconsiderable, and can be easily performed by either keeping a few children after school each day for a week, or, what is much better, having a regular half day set aside each fall, by the school superintendent, to be devoted to the tests. In this way it can be seen that the tests can be easily finished in a week or a day, according to the method adopted for from three to five minutes to a pupil is all the time that is required, and by thus systematizing and subdividing the work amongst the room teachers, all the pupils in a city can be examined in the time specified. Some have suggested that the work be done by school cadets, and this is not a bad plan; but inasmuch as the room teachers live in closer contact with the children and come to learn their physical defects by daily observation, it would seem as if they were better qualified to answer the questions propounded in the tests than anyone who might be otherwise designated for the work. I further believe that instead of the tests imposing extra work upon already overworked teachers, that in the end their labor will be materially lightened; for many defective children, who from apparent stupidity induced by unrecognized eye or ear defects, obstructing the way to educational acquirements, are the despair and dread of their teachers, who spend hours of time in nerve-exhausting labor in the hopeless endeavor to maintain their grades, may be suddenly transformed by glasses, or other eye or ear treatment, from thickest density into intellectual brightness, thus relieving the teacher of at least one burden that sends her home at night in a condition of physical and nervous exhaustion. I am confident that if the eye, ear, nose and throat defects in any room in any school could be eliminated, the work of the teacher would be enormously lightened, and, if this is true, they should be willing from purely selfish reasons alone, to say nothing of the benefits to be derived by the pupils, to cheerfully and gladly see that these tests are annually executed.

Some critics fail to commend the results of the tests, because many parents disregard the school warning. This criticism seems rather puerile, and is equivalent to refusing a $100,000 legacy because $1,000,000 was not left to the beneficiary. Undoubtedly many parents, through ignorance, impecuniosity, pride, neglect, etc., fail to seek medical advice for their children after cards of warning from the school authorities have been received, but on the other hand a large majority of the parents so warned unquestionably do as they are advised, and profit thereby. It has been also observed that most of the parents who primarily ignore the warning, from seeing the beneficial results upon their neighbors' children, or from the awakening of latent parental responsibility, or from some other cause, eventually seek medical advice, and become stout advocates of the plan. In any event, even if only a small minority of defective children are benefited by the tests, they are certainly worth while, and the tests should not be abandoned because all parents are not ready to receive them.

Some observers regard the tests lightly because they are frequently abandoned after having been used for one or two seasons. This is a most unjust criticism, and does not in any way argue against the usefulness of the plan, but does emphatically argue in favor of the inexcusable neglect and laxity of the school authorities. There can be no doubt of the enormous utility of the tests when properly and persistently applied, and yet it is but human nature to shirk all possible work, and as most teachers are already overworked, unless the school authorities annually urge, or demand, the execution of these tests, they may fall into general disuse, and eventual abandonment. I wish, then, to earnestly plead with those in authority not to leave this matter to the option of individual teachers, but to require that the tests become a regular part of the school curriculum, and that they be annually performed at the commencement of each fall term. Many teachers object to the tests on account of the elaborate records and statistics suggested or required in some cities where the plan has been adopted. When I first proposed the tests I advocated rather elaborate statistical records, to be kept by the school teachers. Experience has, however, considerably dampened my ardor in this direction, and I now recommend the very simplest records or none at all. A multiplicity of records can scarcely aid us in deductions which are already trite, and from the examination of thousands of teachers' reports I can hardly recommend them as very valuable from a medical standpoint. To my mind they represent more useless work than actual value, and, while some records should possibly be retained, I would advocate that they be of the most elementary character, perhaps simply giving the names of the pupils, and whether a card of warning was given, and whether it was for an eye, ear, nose or throat defect. This brief report could be handed to the school principal and then to the school superintendent, and would simply show that the tests had been made, which is really about all that is necessary. I wish to emphatically urge that the less elaborate the tests can be made in every way the more surely will they be performed, and that there is no surer method of defeating the end in view than by elaborating and embellishing what should be a simple and uncomplicated affair.

Some observers have raised the objection that until the tests can be legally enforced by act of legislation, it is useless to advocate their adoption by school and health authorities, as they will not be performed unless under compulsion. This argument seems almost an insult to intelligence and benevolence, and I am well convinced that when boards of health, boards of education, school superintendents, school principals and school teachers once become convinced of the usefulness and necessity of the tests, and the ease with which they can be accomplished, legal authority will not be needed to enforce their adoption. Be that as it may, however, and admitting that legal enforcement by the state legislature, as has been accomplished in Connecticut, is the best method of securing the end in view (a statement which I am not at all prepared to accept), certainly there can be no better process by which to popularize the movement than by first appealing to the intelligence of health and educational boards, school authorities, and the people at large.

Some critics have objected to the tests on account of their expense. In the first place, even if the expense was multiplied many times its actual amount, this objection should shame the objector when the enormous possibility for good, resident in the tests, is considered. Besides this the expense is so small that it should not for one moment be considered, as, even for a large city containing 5,000 school rooms, the expense need not exceed $100 a year after the first year. Each school room should possess a testing chart, which will be subsequently described. When purchased in large quantities these charts, with teachers' instructions attached, can be purchased for $40 a thousand. A city with school rooms can, therefore, be supplied with a chart for every room for $200. After being used the charts can be carefully laid away and preserved for future use, so that new charts will only be necessary once in several years. The only other expense will be for the warning cards to be sent to parents, and the simple report blanks, to be retained at school, which, for even a large city, could not exceed $100 a year.

I have been at work on this movement ever since 1895, endeavoring to perfect and simplify the plan, and to secure its adoption in the various cities and states. Over 10,000 mailed communications of various kinds, including letters, circulars, etc., have passed out of my office during that time. Much encouragement and, I am sorry to say, considerable opposition, chiefly of a professional nature, has been encountered; but the work has gone steadily on, and to-day the tests are quite generally used throughout the United States, and in some cities of Europe and Asia. At the last meeting of the American Medical Association, held in New Orleans, May, 1893, I secured the passage of the following resolutions, both by the Ophthalmological Section and the House of Delegates:

"Whereas, The value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures, therefore, be it

"Resolved, That it is the sense of the American Medical Association that measures be taken by boards of health, boards of education and school authorities, and, where possible, legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipiency may be discovered and corrected."

I sent a copy of this resolution to the president and secretary of every state medical society in the United States, and asked them to secure its adoption at their next annual meeting, believing that the favorable action of the American Medical Association and the various state medical societies would be a strong argument to the different state boards of health and education. Nearly every state medical society which has convened since the last meeting of the American Medical Association has passed the resolution, and I am gratified to here enumerate them: South Dakota, Michigan, Montana, Delaware, Minnesota, Colorado, and New York; the Southwestern Medical Association and the Mississippi Valley Medical Association have also passed them, and I believe that pracically all the other states will do likewise, as their annual meetings occur.

I have also communicated with every president and secretary of every state board of health and state board of education in the United States; sent them in resolution; stated the necessity for the tests; handed them a question blank to be made out, and asked them to pass the resolution and set the plan in operation in their several states. I also sent them a circular containing a description of the tests, which has been for a year or more sent out quarterly by the Illinois Board of Health to all county superintendents of schools, requesting them to place the plan in operation in their various counties. I also sent them a circular issued by Mr. Almer Coe, of 74 State street, Chicago, Ill., giving prices for the test cards, with teachers instructions attached.

As a result of these communications and inquiries, I found that while the tests were being quite generally used from one end of the country to the other, they were being systematically used only in Connecticut (under a state law), New York (under the State Board of Health), and Illinois, where I had, a year or so ago, secured their adoption by the State Board of Health. Shortly after my communications had been distributed, however, the State Board of Education of Texas, Kansas and Minnesota passed the resolution and placed the tests in operation in those states. The State Board of Health of Montana, a few weeks ago, also adopted the resolution, and placed the tests in operation in that state.

I secured the adoption of these resolutions last October at the meetings of the State and Provincial Boards of Health of North America and the American Public Health Association, feeling that as the membership of these societies is composed of members of the different health boards in the various states, that they would return home convinced of the usefulness and necessity for the plan, and secure definite action at their next state board meetings. Nor have I been disappointed, for in reply to another urgent appeal sent to the various state boards of health officers, early in November, I have already received replies from Wisconsin, Minnesota, Indiana, South Dakota, Michigan, Florida, Kansas, Colorado and Ohio, telling me that at the next meeting of the boards the resolution will be adopted and the tests placed in operation, generally after the manner indicated by the Illinois circular. As soon as I have still further good news to report I shall again appeal to the various boards of education, telling them of the action of the boards of health throughout the country, and urging them to unite with them in this laudable undertaking. I shall again appeal to boards of health who have not adopted the plan, and also the various state medical societies as they meet from time to time. In a word, I am confident that at the next meeting of the American Medical Association, in June, I shall be able to report that the plan has been endorsed by almost every state medical society in this country, and is in opeartion in almost every state, under the supervision of the several boards of health and education.

Having now gone over the subject as fully as seems desirable under the circumstances, and endeavored to answer most of the important objections to the tests that have been from time to time enumerated, I will now endeavor to describe the details of the tests and demonstrate the ease and facility with which they may be accomplished.

The chart which I recommend contains the ordinary test letters of Snellen, so constructed as to size as to be seen by a normal eye at certain definite distances. For instance, the line marked 20 should be seen by a normal eye at twenty feet, producing vision which is designated by the fraction 20.20. The line marked 100 should be seen by a normal eye at 100 feet, etc. Should, however, an eye be able only to read, let us say, the line marked 70, at twenty feet, the vision would be expressed by the fraction 20-70. The distance between the child and the chart always constitutes the numerator of the fraction, while the smallest line which the child reads constitutes the denominator. If even the largest number, marked 200, cannot be seen at twenty feet, the vision may be expressed by ascertaining the distance at which fingers can be counted. It sometimes happens that figures cannot be seen, and that vision is reduced to a mere perception of light, or even to total blindness. The reason for testing vision at twenty feet is simply because this is usually a convenient distance, and is the distance used the world over for this purpose. It is well, therefore, to adopt the customs already in vogue.

Below the testing letters of the chart will be found the teachers' instructions as to how the tests may be made, this portion of the chart being separated from the Snellen's test types by a half broken line through which the teacher should separate the upper from the lower card, the former of which should be hung on the wall when the tests are in progress, and the latter retained on her desk for guidance.

The cards of instruction reads as follows:

....

DETACH BY BREAKING ON THIS LINE.

Do not expose the card except when in use, as familiarity with its face leads children to learn the letters "by heart."

First grade children need not be examined.

The examinations should be made singly and privately.

Children already wearing glasses should be tested with such glasses properly adjusted on the face.

Place the Vision Chart for Schools (Snellen's) on the wall in a good light. Do not allow the face of the card to be covered with glass.

The line marked XX (20) should be seen at twenty feet; therefore, place the pupil twenty feet from the card.

Each eye should be examined separately.

Hold a card over one eye while the other is being examined.

Do not press upon the covered eye, as the pressure might induce an incorrect examination, Have the pupil begin at the top of the test card and read aloud down as far as he can, first with one eye and then with the other.

FACTS TO BE ASCERTAINED.

1. Does the pupil habitually suffer from inflamed lids or eyes?

2. Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's Test Types, with either eye?

3. Do the eyes and head habitually grow weary and painful after study?

4. Does the pupil appear to be "cross-eyed"?

5. Does the pupil complain of earache in either ear?

6. Does matter (pus) or a foul odor proceed from either ear?

7. Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room? Each ear should be tested by having the pupil hold his hand over first one ear and then the other. The pupil should close his eyes during the test.

8. Is the pupil frequently subject to "colds in the head" and discharges from the nose and throat?

9. Is the pupil an habitual "mouth breather?"

If an affirmative answer is found to any of these questions, the pupil should be given a printed card of warning to be handed to the parent, which should read something like this:

CARD OF WARNING TO PARENTS.

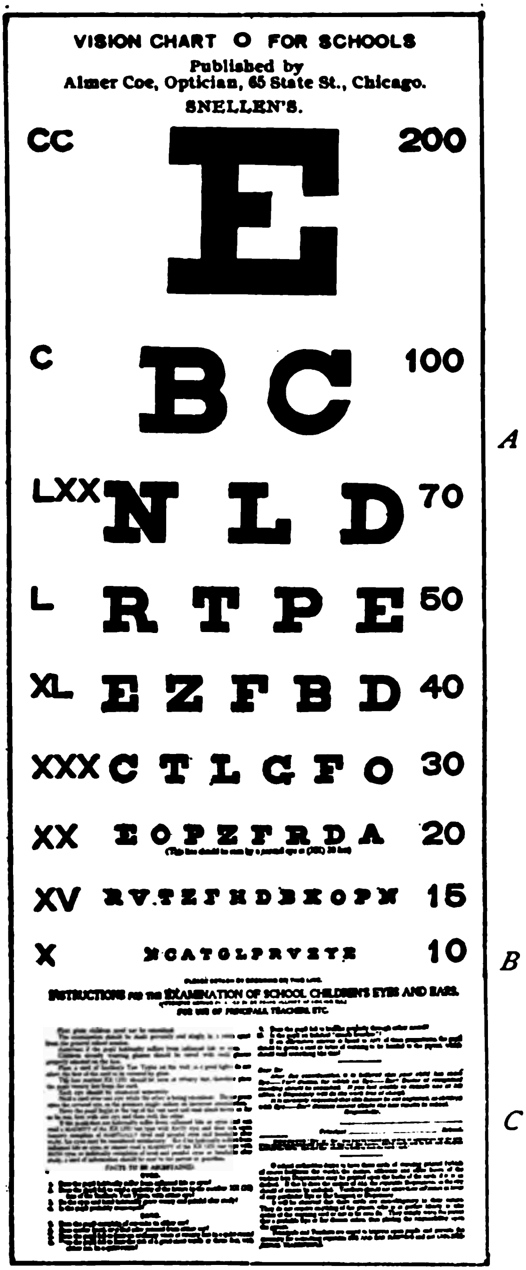
After due consideration it is believed that your child has some eye, ear, nose or throat disease, for which your family physician or some specialist should be at once consulted. It is earnestly requested that this matter be not neglected. Respectfully,

....

School......

If only an eye disease is suspected, the words "ear, nose and throat" should be crossed off; if only an ear disease is suspected, the words "eye, nose and throat" should be crossed off; if it is only a nose and throat disease, the words "eye and ear" should be crossed off.

It will be observed that these words are non-obligatory in their nature. They do not require anything of the parent, who is at perfect liberty to take notice of the warning card or not, as he sees fit. They simply warn the parent that a probable disease exists, thus placing the responsibility upon the parent,


VISION CHART O FOR SCHOOLS
Published by
Almer Coe, Optician, 65 State St., Chicago.
SNELLEN'S.
CC E 200
C B C 100
LXX N L D 70
L R T P E 50
XL E Z F B D 40
XXX C T L G F O 30
XX E O P Z F R D A 20
XV R V T Z F H D B E O P N 15
X N C A T G L P R V Z T E 10
INSTRUCTIONS FOR THE EXAMINATION OF SCHOOL CHILDREN'S EYES AND EARS.
FOR USE OF PRINCIPALS, TEACHERS, ETC.
A
B
C

REPRESENTING THE SCHOOL CHART.

A. The portion to be hung on the wall.
B. The line where the two portions are to be separated.
C. The portion containing the teacher's instructions.

Nevertheless, if parents neglect the warning thus conveyed, the teacher should, from time to time, endeavor to convince such parents of the advisability of medical counsel. Teachers are urged to impress upon pupils and parents the necessity for consulting reputable physicians.

These tests should be made annually at the beginning of the fall term, and should include all children above the first grade.

Each teacher should examine all the children in his or her own room, and should report the results of such examination to the principal, such report to be signed by the examining teacher.

The following simple form of report to be filled out by the teacher and handed to the principal is suggested, and may be printed upon paper of any size and character that is deemed advisable by the local school authorities, and should be distributed to the different room teachers:

No.	The Name of the Pupil.	Do the tests indicate an Eye, Ear, Nose or Throat Disease? Answer "yes" or "no." If yes, which?	Was the pupil given a card of warning?
1.	John Doe 92 State Street.	Yes Eye	Yes

SOCIETY PROCEEDINGS

PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, Tuesday, December 8, 1903.

D. J. MILTON MILLER, M.D., CHAIRMAN.

CONGENITAL HEART DISEASE (PULMONARY STENOSIS AND PERFORATE SEPTUM VENTRICULORUM ?).—The patient was a boy of six years, the other children in whose family were without abnormality. This boy was "blue" at birth, and has been cyanosed and dyspneic all his life, slight exertion always materially increasing these symptoms. He has had no acute disease. He is undersized for his age, with a decidedly cyanotic facies—the cheeks, lips, and ear-lobes, as well as the mucous membranes, being of a deep-blue color. The fingers and toes are very much clubbed, cyanosed, and cold; and the superficial veins, dilated. The pulse is irregular, the right being at times of slightly larger volume than the left. The apex is palpable rather diffusely in the fifth interspace one-quarter to one-half inch to the left of the nipple line. A slight thrill, systolic in time, is occasionally to be felt over the precordia. The cardiac dullness extends from the third rib to one-quarter inch outside the nipple-line; and to the right, to the middle of the sternum. At the apex, there is a harsh, long stystolic murmur, transmitted moderately well into the axilla, and followed by a well-defined second sound. A systolic murmur, harsh in character, is also heard at the aortic cartilage. The second sound is readily detected there, also; but is not so loud as at the apex. In the pulmonary area, the same murmur is audible; but it is more intense and, at times, almost hissing in character. Following this comes a weakened second sound. The murmur is transmitted loudly along the whole course of the clavicle toward the left shoulder. A murmur of much the same character may be heard all over the precordia, but is most intense over an area extending from a point one inch to the left of the sternum, to the left border of the heart; and from the second rib, to the fourth interspace. It is exceedingly high and shrill just inside the left nipple. The murmur can be detected the whole length of the sternum, but with diminished intensity. It grows louder as the stethoscope is moved outward from the left border of the sternum. A murmur can also be heard in the cervical vessels and over the whole of the chest posteriorly, though more to the left than to the right, The lungs and the abdomen are negative. A marked polycythemia is present, the red corpuscles numbering 8,750,000; the white cells 7,840. The hemoglobin is over 100 per cent. The X-ray has shown no enlargement of the terminal phalanges. As is so often the case in congenital heart-disease, the patient exhibits other stigmata:—The penis is curved downward and to the left, and bound down for about half its length to the scrotum; while the meatus is on the under surface of the glans. The eyes have always been "weak," and occasionally painful. On examination, they showed "intermittent nystagmus, patches of choroid atrophy, especially in the right eye, and enlargement, but little tortuosity of the vessels; no choked disc." The body's temperature is usually a little above normal—98.3 degrees F. to 100.5 degrees F.

The most interesting feature in connection with the case is the nature of the cardiac lesion. Aortic stenosis and mitral regugitation could be easily excluded, not only on account of the physical signs, but also because of the evidently congenital nature of the case; while the harshness and the long-drawn character of the pulmonary murmur, with its distribution to the shoulder, combined with the weakness of the pulmonary second sound and the marked cyanosis, point strongly to a narrowing of the pulmonary orifice. As, however, this lesion does not explain the loudness of the murmur over the middle of the left ventricle and at the apex, and as the usual signs of mitral disease, particularly marked enlargement of the right ventricle, are absent, it seemed quite probable to the speaker that a perforate septum is also present. Whether the third malformation usually accompanying he foregoing conditions (a patulous ductus arteriosus) also exists, he, of course, could not determine. In making this diagnosis, he was quite aware how often one's antemortem ideas of congenital heart-disease are completely upset by the postmortem findings.

Dr. Griffith agreed with Dr. Miller as to the diagnosis. He, however, referred to the interesting fact that the murmur can be heard very loudly in the mitral region; and this suggested the idea that the chief lesion might be a congenital mitral regurgitation. Against this view is the important point that there is no determinable enlargement of the right heart. Dr. Griffith thought the murmur heard near the mitral region to be probably due to a perforate septum.

A Case of Cretinism.—Dr. J. P. Crozer Griffith exhibited a cretin of extremely well-marked type, the patient being a child of fourteen years. He said that the condition had grown distinctly worse since the age of two years. The child is able to walk, when assisted. The intelligence is infantile. The deposits of fat are very characteristic; and the tongue is constantly protruding from the mouth, reaching down to the chin.

Dr. L. J. Hammond asked Dr. Griffith whether cretins are as susceptible to the diseases of childhood as are other children.

Dr. L. H. Bernd said that he had had under observation for two years a case in which the use of thyroid had caused the physical appearances of cretinism to vanish within nine months to such an extent that, he believed, no one would have thought of cretinism in the case from the physical condition of the child. The mental condition, however, has not improved to any noteworthy extent. The speaker said that he had suggested and urged transplanting the thyroid from one of the lower animals into the child; but that permission for this had, as yet, been refused by the parents. He asked Dr. Griffith whether he knew of any instance in which the transplanting of the thyroid had been carried out.

Dr. Griffith, in reply to Dr. Hammond, said that these children apparently contract diseases in about the same way as do other children. He knew of one instance in which a cretin had acquired typhoid fever; and, if he remembered correctly, had died of that disease. In reply to Dr. Bernd, Dr. Griffith said that he could not recall any case described in which transplanting the thyroid had been carried out. He thought that in the case exhibited mental improvement is hardly to be expected, even if some improvement in the physical shape of the boy could be secured. While the effect of thyroid in many cases is strikingly good, one should remember that there are limitations to its usefulness. Its effects are not always satisfactory, particularly in relation to the mental disorder; and its influence upon the physical condition may be unsatisfactory, or render it necessary to discontinue it. The speaker mentioned a case in which the general appearances of cretinism were greatly improved every time that thyroid was employed; but, at the same time, the child has always showed progressively increasing weakness, and the medication always had to be discontinued on account of its prostrating effect. Usually, of course, the effect of thyroid in cretinism is strikingly good.

PARALYSIS OF THE BLADDER—REPORT OF A CASE.—Dr. Griffith then reported a case of paralysis of the bladder in a girl of four years. This appeared to have followed an attack of measles. The patient had also a poliomyelitis in early life; but no distinct connection could be traced between the two conditions.

In answer to a question by Dr. Burr as to whether local disease of the bladder had been excluded, Dr. Griffith said that the child had not been sounded for stone, but he thought that everything else had been done.

Dr. Burr referred to the importance, in cases of apparent isolated paralysis of the bladder, determining the absence of any local cause producing the trouble. As an example, he referred to the case of a woman sent to him with the diagnosis of palsy of the bladder. Incontinence of urine was present, but there was no other sign of nervous disease. As the speaker had never seen nor known of a case of isolated palsy of the bladder due to disease of the central nervous system, he sent her to a surgeon, who found that there was a growth pressing upon the neck of the bladder and mechanically causing the symptoms. In other words, there was no true palsy at all. Dr. Burr asked Dr. Griffith how long the child had had this condition.

Dr. Griffith replied that the child had had it since October, 1902. Dr. Burr thought that in Dr. Griffith's case the leg trouble and the bladder trouble were separate conditions. He believed that the child had had poliomyelitis, which had caused the condition seen in the leg; but that the bladder trouble was probably due to a neglected cystitis.

Dr. J. K. Young referred to a case of spinal injury in a girl of twelve years, due to a fall from a car. In this case there was retention of urine for seven days, together with paralysis of the legs. The child had to be catheterized, and the urine was frequently bloody. At the end of a week, however, she began to regain power over the bladder. This power was ultimately recovered entirely, while the paralysis of the legs persisted. The child was seen by Dr. Mills and Dr. Willard, and both agreed in the diagnosis of hemorrhage into the cord.

Dr. Hammond referred to a case of temporary paralysis of the bladder in a boy of five years, in which an impacted calculus was found in the urethra. The stone was removed, but the paralysis continued for two or three weeks afterward. Calculi constitute a well-known cause of dribbling of the urine. The speaker referred to the value of ergot in treating these conditions, when unassociated with lesions of the cerebrospinal centres. The same action upon the involuntary muscles of the bladder should be expected from its use as is obtained upon the same type of muscles in the uterus. Dr. Hammond also mentioned irrigation, which he considered preferable to the use of a retention-catheter, keeping in mind the necessity of rigid asepsis.

Dr. Maurice Ostheimer referred to the fact that the retention with overflow in this child had come on directly after an attack of measles, and asked Dr. Burr whether it is not possible that the condition may have been due to some nervous lesion set up by that disease. He also asked whether the measles could not have caused a recrudescence of the old spinal trouble.

Dr. Burr replied that he knew nothing of bladder trouble due to measles. He thought it possible for that disease to light up an old poliomyelitis, although he had never seen this occur; but in that case there would have been an acute paraplegia, which had not been observed in this child.

Dr. Griffith, in closing the discussion, said that he had exhibited the patient for two reasons: First, because paralysis of the bladder is an exceptional condition in childhood; and, secondly, because of the association of the two conditions in this child. He believed the two to be separate and distinct. He thought that the most satisfactory explanation is that of an original poliomyelitis, followed later by paralytic distention of the bladder due to an entirely distinct cause—probably a neglected cystitis.

A CASE OF MULTIPLE NEURITIS.—Dr. Griffith exhibited a child with a severe form of paralysis, apparently due to a neuritis that had been consecutive to an attack of scarlet fever, followed by whooping-cough, and then by mumps. He considered it uncertain whether the child had not had diphtheria, when it had scarlet fever; since, when seen, speech was distinctly involved. The affection of speech has disappeared; but the paralysis of the body is growing worse, there being decided ataxia with loss of power.

Dr. Theodore Le Boutillier referred to two cases of post-diphtheritic paralysis that he had recently seen in the dispensary of St. Christopher's Hospital. It was originally somewhat difficult to determine the cause of the trouble in these cases; but he ultimately learned that the children had had sore throat eight weeks previously, and there was then very little doubt that the cases were diphtheritic paralyses.

Dr. Alfred Hand, in connection with the difficulty of finding the cause of an infectious neuritis, referred to a case that had been sent into the Children's Hospital with a diagnosis of empyema following pneumonia; although exploratory puncture before admission did not show the presence of pus. The child had possibly had pneumonia, but plainly exhibited a marked and widespread neuritis; she was too young to complain of double vision, and fluids did not regurgitate through the nostrils, probably because she was unable to sit up and was fed in a recumbent posture. For a few days the neuritis was looked on as an unusual sequel of pneumonia; but soon afterward several cases of diphtheria developed in the ward; and, in taking routine cultures from the throats of all the patients in the ward, it was found that he throat of the child with neuritis, though normal in appearance, yielded a pure culture of diphtheria bacilli. The source of the neuritis, as well as the cause of the diphtheria outbreak, at once became evident. On close questioning, the mother then admitted that the child's illness had begun with a sore throat.

In answer to a question by Dr. Burr as to whether the onset in this case had been sudden or gradual, Dr. Griffith said that, so far as he could determine, the disease had come on somewhat slowly. Dr. Burr referred to the fact that the child had marked ataxia, as well as some palsy. He believed the lesion to be spinal, with a slight affection of the peripheral nerves. A point of much interest in such cases is the prognosis; if a patient survive as long as has this boy, recovery is almost certain.

Dr. D. L. Edsall said that he had had a case on the programme of the May meeting under the diagnosis of disseminated encephalomyelitis. In that case the conditions about ten days after the patient had come under the speaker's observation were quite similar to those in the child exhibited by Dr. Griffith. The onset, however, had been distinctly different, in that there had been much more pronounced cerebellar and bulbar symptoms. The disease had appeared after an attack of measles, and the first symptoms had been noted about three weeks after the eruption of that disease. The nervous condition had begun with violent attacks of vertigo, with some disturbance of vision and difficulty in swallowing; also with some disorder of speech—chiefly a thick articulation. When admitted to the Episcopal Hospital, the patient had profound ataxia, with a most striking reeling, drunken gait, of the characteristic cerebellar type; but with comparatively little muscular weakness. After admission, there was progressive increase in the muscular weakness, and, as stated, the condition soon resembled that presented in Dr. Griffith's patient. Dr. Edsall's patient grew progressively worse for about a month, and finally became so extensively paralyzed that he could not raise himself in bed and could do scarcely anything for himself. His condition seemed extremely grave; but improvement began rather gradually. It soon progressed with great rapidity, and the patient was entirely well within two months.

Dr. Burr said that the case was apparently one of diffuse myelitis, with involvement of the posterior ganglia and affecting mostly the anterior horns of the posterior columns.

CHOREA TREATED BY INTRAVENOUS INJECTIONS OF COLLARGOL. —Dr. Edsall reported a case of chorea of the septic type treated by intravenous injections of collargol, which apparently had a markedly favorable effect upon the temperature and a striking effect upon the child's general condition. The septic appearance of the patient, together with the prostration, rapidly disappeared. The choreiform movements, also, soon improved greatly; although for a week previously the child had been treated with sedatives, salicylates, etc. She ultimately recovered entirely, except for a gravely deranged heart. The speaker also referred to other cases, partly in children and partly in adults, in which he had treated rheumatism, sepsis, typhoid fever, and other conditions with intravenous injections of collargol. He had seen no bad effects, except in one or two instances in which sore arms had been produced by missing the vein and injecting collargol into the subcutaneous tissues. As to the influence of collargol upon the infections in the various cases, he was disposed to be guarded in his statements; but he felt that there had been a favorable influence exerted in a number of cases of septicemia, and that the effects had been sufficiently marked to encourage him in using the preparation further. Dr. Edsall said that one could hardly expect that collargol would have any influence in this case upon the structural changes in the heart. If it had had any effect, this was rather upon the element of infection; that is, it had controlled the bacterial process and had cut short the attacks.

Dr. W. E. Robertson said that he had used the ointment of collargol recently, in a case of endo-, myo- and peri-carditis, with apparently decided success. He believed that the preparation might wisely be much more widely used. Theoretically, at least, the so-called "inorganic ferments" are indicated in any infectious process; although the only collodial preparation that has thus far received extended trial is that made from silver—either collargolum, for intravenous use, or the Crede ointment, prepared from the former.

THE NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Stated Meeting, Thursday, December 10, 1903.

HENRY HEIMAN, M.D., CHAIRMAN.

HYPERTHROPIC CIRRHOSIS OF THE LIVER IN A CHILD OF SIX YEARS.—Dr. Samuel M. Evans presented the patient. There was no history of tuberculosis or syphilis; indeed, there was nothing in the history bearing on the causation of the cirrhosis except the habit of coffee-drinking. He believed personally that the cirrhosis was dependent upon an autointoxication arising from the intestine.

A CASE OF HENOCH'S PURPURA, WITH NECROPSY.—Dr. William L. Stowell reported this case, and also referred briefly to another case, occurring in a child of three years, that likewise terminated fatally. He said that Henoch's purpura was that variety of purpura characterized by hemorrhages from the gastrointestinal tract. The child made the subject of this report was bottle-fed, and was two weeks old. There had been bloody stools and a purpuric eruption for a few days before coming under observation. In a few weeks the child became edematous and died. As a diagnosis of dysentery had been made, Dr. W. H. Park made a thorough bacteriological examination. He was enabled in this way to positively exclude that disease. At the autopsy, the heart was found to be normal, though there were some ecchymotic spots on the pericardium. The kidneys and spleen were normal. The liver was very dark. The lower part of the ileum and the colon were dark and congested. The disease was now thought to be infectious. An examination of the blood showed it to be normal.

Dr. L. E. La Fétra suggested that it would be hard to differentiate the case just reported from those not very uncommon ones in which badly nourished children developed petechiæ on various parts of the body. In a recent case that he had seen, occurring in a marantic baby fed at the breast, there was a large collection of blood in the veins of subcutaneous tissue, giving rise to the formation of little masses.

Dr. Henry Heiman said that examinations of the blood had been made repeatedly in these cases of Henoch's purpura, but the blood had invariably been found normal. One must, therefore, look for a microbic origin, or an anatomical deficiency in the blood vessels.

Dr. H. Koplik observed that in two of his own cases, as well as in one reported by Dr. Heiman, blood cultures were negative.

SYMPOSIUM ON LOBAR AND BRONCHOPNEUMONIA IN INFANTS AND CHILDREN.—This embraced the following papers and remarks:

Pathology.—Dr. David Bovaird, Jr., opened the symposium with a paper on the pathology. He said that there were no striking differences in the pathology of lobar pneumonia in early and later life. On section, the lung presented a fairly uniform color and a granular appearance. Partial consolidation of one lobe was more common in children than in adults. The amount of pleurisy was subject to wide variations. Occasionally, small abscesses, or more or less extensive gangrene developed. The most important associated lesions were found in the pericardium, meninges and peritoneum. Bronchopneumonia occurred in about 40 per cent. of all the autopsies at the New York Foundling Hospital. In the first stage there were usually rings of deep congestion surrounding the bronchi, and on opening the latter, a bronchitis was found. The smaller bronchi contained an exudate and the walls were infiltrated with leukocytes. In the second stage, areas of consolidation were scattered here and there through the lung. In the third stage, these areas merged into one another, but the granular appearance observed in lobar pneumonias was lacking. Empyema was a comparatively frequent accompaniment of bronchopneumonia in children, far more commonly than in adults. In about 95 per cent. of the lobar pneumonias, and in 50 per cent. of the bronchopneumonias the pneumococcus was the infecting agent. The tendency of modern opinion was to give more prominence to the general infection and diminish the importance of the local lesion.

Symptomatology and Diagnosis.—Dr. William P. Northrup took up this phase of the subject. He said that experienced nurses and hospital matrons became very expert in detecting the very early symptoms of pneumonia in children. The onset of the disease was abrupt. Runabout children would begin by refusing food, becoming pale and drowsy and, perhaps, vomiting. Nurslings would cry and cough, the nose would become stuffed and there would probably be fever and vomiting. Very soon the presence of toxemia was indicated by drowsiness, chilliness, irritability and fever, and—most important of all—the pulse-respiration ratio would be changed from one to four to approximately one to three. This fact alone should always lead the physician to search for a lesion in the lungs. A little later there would be diminished respiratory murmur over the affected lung, and successively, harsh breathing, bronchial voice, bronchial breathing and bronchial whiff. Cough was by no means a constant symptom. The degree of toxemia was, as a rule, proportionate to the extent of lung involvement. The stupor might be so profound as to lead to a suspicion of cerebral mischief, and this suspicion often appeared to find support in the presence of some stiffness of the neck; but careful examination of the pneumonia patient would also show resistance in both shoulders and arms, and a disturbance of the pulse-respiration ratio. At times, the presence of a mucous diarrhea served to obscure the diagnosis. This phenomena, in connection with pneumonia, he was disposed to consider an effort of nature at elimination of toxins. Occasionally, cases of pneumonia in early life bore a very close resemblance to appendicitis.

Treatment.—Dr. J. E. Winters opened the discussion on this topic, confining himself to a consideration of lobar pneumonia. He said that almost every case of lobar pneumonia in early life would terminate in recovery, whether treated or not; hence, such treatment as was employed should not be of a nature that would greatly disturb the little patient. He always insisted that the patient be kept in a warm bed in a room having a temperature of at least 72 degrees F., and he did this because he believed that a cold skin meant contracted cutaneous vessels, and that this, in turn, meant interference with elimination of heat, and consequent increased work for the heart and increased congestion of the already weakened vessels of the diseased lung. Physiologists taught us that about 90 per cent. of the heat loss was by conduction, radiation and evaporation from the body surface; moreover, it should not be forgotten that the external application of cold resulted in a rise of the internal temperature. He objected strenuously to the application of cold to the body surface of a child, not only for these reasons, but because it caused intense nervous excitement and unnecessary resistance; and anything which caused resistance on the part of the child resulted in a rise of body temperature. The child ill with pneumonia should, accordingly, be wrapped in flannel and placed in a crib in a part of the room not exposed to draughts of air. To quiet nervous excitement, nothing was better than the old-fashioned Dover's Powder—not the powder commonly sold at the present time under that name, in which sugar of milk was substituted for the sulphate of potassium. The original powder was an excellent diaphoretic, and, as such, was indicated in pneumonia. Aconite was urgently indicated in the early stage of pneumonia, and, for the purpose of still further exciting diaphoresis, he was accustomed to prescribe twenty drops of sweet spirits of nitre every hour to an infant of one year. The food should be reduced in quantity, and the thirst should always be satisfied with water before offering food. The cause of death in children ill with pneumonia was respiratory failure, not failure of the heart as in adults. As a rule, alcohol should be avoided, but when required, as occasionally happened at the crisis, it should be given by the rectum in fairly large doses. In severe cases of pneumonia, oxygen was fully as efficacious as whiskey or strychnine, but it should be given continuously.

Dr. Rowland G. Freeman pointed out that diminished respiratory murmur was not only a valuable diagnostic sign at the beginning of a pneumonia, but it was equally helpful later in the disease as an indication of pleuritic exudation, often an empyema. Too much stress must not be laid upon the physical signs, because pneumonia sometimes ran its course in children without distinct physical signs, and the diagnosis had to be made upon the vital signs and the symptoms. The main points in the treatment were to keep the gastrointestinal tract and the heart in good condition. Abdominal distention was an exceedingly grave complication. He would postpone the use of alcohol until the later stages, and when the heart flagged would give digitalin hypodermatically. Sometimes, when it was very difficult to give any drug, oxygen inhalations would prove very useful as a means of keeping up the heart.

Dr. Charles G. Kerley said that the physician should insist that the infant ill with pneumonia should be kept in the crib and not on the lap, and the sick room should have a temperature of about 70 degrees F. Morning and evening the sick child should be taken into an adjoining room while the sick room was thoroughly aired and then warmed up to the proper temperature again. During the rest of the time direct communication with the outer air could be safely and conveniently maintained by the use of the "window boards." He did not approve of the use of oiled silk or wadding jackets, because they were uncomfortable to the child and made it sensitive to cold during convalescence. The strength of the food should be invariably reduced, and an action of the bowels should be secured once in the twenty-four hours, if need be, by an enema. He rarely used digitalis, and alcohol only when the assimilative powers were at a low ebb or stimulation by other means failed. Regardless of whether the body temperature was 103 degrees or 106 degrees F., antipyretic measures were employed only when needed to quiet delirium or produce sleep, and unlike Dr. Winters, he had found the cold pack just the thing for this purpose. The body and upper half of the thighs should be wrapped in a large bath towel that had been wrung out of water at 99 degrees or 95 degrees F., the arms and legs being kept free. Gradually the temperature of the water used to moisten the towel was reduced to the point which was found best for the individual case. To avoid unnecessary disturbance of the patient, he should be rolled from side to side and the pack moistened as required. With regard to bronchopneumonia, the speaker said that in addition to the treatment already outlined for lobar pneumonia, certain measures were required because the disease did not terminate by crisis, but continued for an indefinite period. In the early stages of the disease, much benefit would be derived from the use of the mustard jacket and steam inhalations. In the application of the former, one part of mustard was mixed with two parts of flour and applied to the skin until thoroughly reddened at intervals of four hours. The steam inhalations were of great value in bronchopneumonia, and should be given for thirty minutes every hour or so, using twenty drops of creosote to one quart of water. Oxygen was sometimes of value, but should be given intermittently, as he had found no advantage in its continuous use.

Dr. Henry Koplik said that when Dr. Winters considered cold as very detrimental to children, he simply echoed the sentiment of most physicians who had had much experience with children. In the management of the temperature of pneumonia the physician's main reliance should be on hydrotherapy, but little children did not, as a rule, react well to cold. A sponge bath with lukewarm water would often answer the purpose, or the application of a wet pack at 85 degrees F. He would expect more harm than good from the use of aconite and strychnine by the young physician in infantile pneumonia. Alcohol was, in his opinion, valuable both as a drug and a food. He objected to steam inhalations on the ground that they excluded fresh air and loaded the air of the sick room with moist vapor. Poultices were not desirable because of the weight upon the chest. When there was a slight effusion in the chest after a pneumonia had lasted some days, it was generally well to postpone active interference.

Dr. W. L. Stowell said that both theoretically and practically croupous pneumonia was benefited by steam inhalations, and bronchopneumonia was also benefited, although, theoretically, it should not be. Many cases of pneumonia did well in tenements under very primitive treatment.

Dr. Walter Lester Carr said with regard to the presence of cough in children, that it was frequently present in pneumonia, and its presence was shown by an expiratory grunt. There were usually gastrointestinal symptoms present in connection with lobar pneumonia. It was important to differentiate between lobar and bronchopneumonia; the former required almost no treatment, whereas the latter often called for active medicinal measures.

Dr. Kerley thought he had been misunderstood concerning his use of cold in children. He did not make use of any great degree of cold, and always used it cautiously and to meet indications.

Dr. S. H. Dessau remarked that his personal experience had led him to place dependence, in making the prognosis, upon whether there was much albumin in the urine.

Dr. Winters said that he restricted the use of aconite in the pneumonias of children to the first forty-eight hours. The common practice of employing strychnine throughout the disease was to be deprecated; it should only be used at the crisis. Sometimes when the child was suffering from high fever, great relief would be afforded by wrapping up a long and narrow ice-bag in a towel and fastening it around the neck over the large vessels. Such a method of applying cold did not interfere with the cutaneous circulation.

Dr. Bovaird, in closing, called attention to some animal experiments made by Dr. Augustus Wadsworth, which seemed to indicate that the production of a lobar or a bronchopneumonia depended upon the relation of the virulence of the infecting organism to the powers of resistance of the animal infected.

EDITORIAL

SCARLATINAL INFECTION—WHERE DOES IT COME FROM, HOW MAY IT BE AVOIDED?

From time immemorial it has been taught that the scales from the desquamating patient were the main sources of contagion in scarlet fever. Instances are on record of the receipt of letters, and the carrying of a contagious principle, and the epidermal scales from the hands have been held responsible.

We are not yet ready to abandon our belief in this present theory of the importance of desquamation as a ready test for the limitation of the stage of isolation, yet there are signs, not to be disregarded, that our ideas concerning the *vivum contagium* in scarlet fever should be subjected to a most rigid scrutiny not only for the sake of avoiding the spreading of contagion, but also to limit, if possible, the days of isolation, and thereby diminish social distress and also increase hospital accommodation.

One of the most recent breezes that has tended to disturb the equanimity of those believing in the desquamation theory has come through a paper by R. E. Lauder, Medical Superintendent of one of the large isolation hospitals of Southampton, England (*Lancet*, March 12, 1904).

Dr. Lauder believes that more careful classification of the cases should be made, and further inclines to the belief that for scarlatina that "return cases," or contagions, are attributable, not to the peeling epidermis, but mainly to undetected discharges from the respiratory passages and ears in those who have left the hospitals. As a result of an entire revision in his system of isolation, an alteration in the time limit of stay and of careful inquiry and investigation, he is led to regard the upper respiratory passages, particularly the naso-pharynx, and the pharyngeal and faucial tonsils as responsible for the reception and propagation of the infection.

If this is true, then more attention should be paid to pharyngeal and naso-pharyngeal antisepsis and less to the pumice stone rubbing process so characteristic for the past twenty-five years.

It is not from this source alone that attention has been directed to other sources than the peeling skin of the unfortunate patient, but the evidence presented by Dr. Lauder is of such a character as to warrant further careful observations along similar lines. We feel positive that in addition to our older methods, a better hygiene of the upper respiratory tract can be practised to advantage.

THE CAUSE OF SMALL-POX

In a former issue of PEDIATRICS we gave a summary of a preliminary communication by the Harvard observers on the etiology of small-pox. We are glad to call the attention of our readers to the elaborate reports recently published in the *Journal of Medical Research,* February, 1904.

In this excellent presentation a number of scholarly papers are presented, which should be consulted by all interested in this important topic.

We cannot feel that we are thoroughly convinced, but certainly here is much food for reflection.

ABSTRACTS

Spontaneous Cure of an Intussusception.—A patient, sixty years old, is suddenly seized with severe colic and all symptoms of intestinal obstruction rapidly follow. Seventeen days later diarrhea sets in and a piece of ileum 32 centimeters long is passed. Eight days after this the patient was able to eat solid food without any disturbance. H. SCHRIDDE (*Münch med. Woch.*, July 28, 1903) was fortunate enough to do an autopsy since the woman died several months later from some pulmonary affection. A narrow, perfect scar was found encircling the ileum 36½ centimeters above the ileocecal valve. Stenosis or adhesions were absent. Like most cases of intestinal obstruction, the etiology here was not clear. Perhaps foreign bodies play a more important role than is thought. A thin and weak mesentery is certainly a predisposing cause. Paralysis of a circumscribed portion of the intestines hardly ever occurs, yet irregular contractions of the gut are probably always present and the peristalsis is considerably increased above the site of obstruction. The invagination does not increase in size by a vis a tergo, but probably by excessive peristalsis at the head of the invaginated portion, which forces this further toward the anus.

Some Cases of Infantile Nephritis.—FRY and MARTIN (*Arch of Ped.*, January, 1904) report the results of the examination of the urine in one hundred infants under three months. The difficulty in obtaining specimens for examinations was overcome by the following expedients: In male children a bottle was firmly bound to the inner side of the thigh, and the child made to lie on the side until the specimen was obtained. In females, reflex stimulation of the bladder was used either by the application of cold to the pubis, or by direct manipulation of the meatus, a bottle being held in place to collect the urine. Of the one hundred infants examined, sixty-five were artificially fed and thirty-five breast fed. The reaction was acid in 64 per cent. of cases, neutral in 36 per cent., alkaline in none. It was noted that the older the infants the more liable was the urine to be acid.

Albumen was present in nineteen of the cases, varying from a trace to a distinct ring, by the Heller test. Of these cases fifteen were bottle fed and four breast fed. Of these nineteen cases seventeen also had casts, hyaline and granular mainly, a few epithelial, but no blood casts. Of the one hundred cases, however, thirty-one had casts—i. e., fourteen had casts without albumen. Uric acid was abundant in twenty-six cases, twenty-three of which showed casts. Sixteen of these twenty-six cases died and autopsies were obtained in seven. Each of these showed parenchymatous nephritis with uric acid infarcts, while three cases showed interstitial changes as well. In additon to the sixteen fatal cases six others had clinical evidence of nephritis. While the relation of increase of uric acid to nephritis in infancy cannot be considered settled as yet, it is significant that of twenty-six cases in this series in which uric acid was increased, twenty-three had casts, and that of these twenty-three sixteen died. The authors do not believe that the nephritis of infancy is necessarily always associated with the toxic conditions incident to marasmus, and they consider it at least possible that there may be some connection between increase of uric acid and the production of a form of nephritis, which under favorable conditions may be recovered from without serious permanent disturbance.

Guaiacol Carbonate in the Treatment of Measles.—This remedy is extolled by D. M. Paton (*The Lancet,* November 21, 1903), who finds it a specific in bronchial catarrh, with fever. The latter is reduced promptly. The remedy has no effect on the measles itself. Bismuth added to the remedy will relieve any tendency to vomit; the same holds true of Dover's powder with reference to diarrhea. The treatment is begun when the diagnosis is made, and continued in full doses till the temperature has fallen to normal, a reduced quantity being given for two days longer to make sure of the result. The dose is calculated at one dram per diem in powders of 10 grains every three hours for adults, and children in proportion. The powder is readily taken, by children, and all the more so if an equal amount of powdered sugar is added. No unfavorable symptoms have ever been seen during its administration, which could in the slightest degree be attributed to the treatment; in no case has it failed to abort the bronchial catarrh, and there have been no deaths.—*The Medical Record,* December 5, 1903.

Subcutaneous Emphysema from Rupture of a Tubercle.—A child of eight years, with Pott's disease, in the service of P. Guillaume-Louis (*Arch. Gén. de Méd.,* Aug. 18, 1903), began to cry out, became excited, and complained of severe headache. This was followed by stiffness of the neck, photophobia and obstinate constipation, and the diagnosis of tuberculous meningitis was made. Suddenly respiration became labored (Cheyne-Stokes) the eyelids and cheeks swelled up, and the eyeballs protruded. This edema gave a fine crepitation and was evidently subcutaneous emphysema. Soon both sides of the neck and the upper part of the chest were involved, and the patient was comatose. She rallied somewhat for a time, but the emphysema progressed, and death took place after ten days. At the post-mortem the lungs were free from adhesions, there was no pneumothorax, but one was struck by the appearance of many small bullæ in the sub-pleural cellular tissue. The mediastinal tissue was crepitant on pressure. In the middle third of the anterior border of the middle lobe of the right lung there was a large vesicle filled with air, and surrounded by several tubercles; the whole lung was emphysematous. Evidently there had been an intrapulmonary rupture of a subpleural tubercle, without perforation of the pleura. The air penetrated the interlobular tissue, and thence reached the mediastinum, neck, and face. There was no meningitis.

Surgical Infections and Collargolum.—Dr. Paul Coudray relates three surgical cases and reviews the action of collargolum thereon. The first was a grave systemic infection in a girl of ten, due to an acute osteomyelitis of the entire femur. There was an enormous swelling of the left thigh, with dilatation of the superficial vessels and intense pain. Diagnosis was concurred in by Prof. Comby. Collargolum was administered daily, and the temperature curve demonstrates the promptness of its action. This staphylococcus infection ran an entirely favorable course under the treatment.

The second case was an appendicitis with suppurative infiltration of the right loin and subhepatic region. Treatment was strictly medical, with daily collargolum inunctions, resulting in complete apyrexia.

The last case is a very curious one, being originally a post-puerperal septicemia and afterwards an influenza. Delivery took place on January 1st. On the 6th, severe septicemia. Temperature 103.3° F., pulse 116, agitation, fetid lochia, tender uterus. Treatment: lavage, with 1 :200 permanganate of potash, intra-uterine curettage, application of half strength tincture of iodine. On the 7th, temperature 100°F., in the afternoon 102°F. Inunction of 45 grains Unguentum Credé, temperature falling to 90.30 F. within an hour. Complete apyrexia took place on the 10th. On the 11th symptoms of influenza; temperature, 103.6.

Collargolum. Fall next day to 102° F. Collargolum. Fall on the 13th and 14th to 97.70° F. and apyrexia afterwards. In this case the rapid action of the Collargolum was as evident in the post-puerperal infection as it was in the influenza.

Dr. Coudray wants to be well understood that he draws no definite conclusions from so small a number of cases. But the remedy has given interesting and important results, and it should certainly be employed.

Hemorrhage in the Newly-Born.—Dr. E. Champion records the histories of two such cases, as follows: On the 19th of June Mrs. M. was delivered of a female child. Labor was precipitate. The child was well-formed and properly developed, but face was noticed to be very slightly cyanosed after bathing.

The bowels acted twice during the first 24 hours, and the child seemed quite comfortable, and slept well. On the second day, when the bowels acted, a large hemorrhage occurred, the blood soaking through serviettes and new flannelette night-dress on to nurse's apron. It was fluid principally, and dark red in color, but there were also a few long dark clots. The nurse applied a cold water pack to the abdomen, and noticed that the child became rather blue about the face, and vomited a quantity of dark fluid. On arrival (about half an hour after onset) the child was found very anemic, with a dusky hue about the face, which did not disappear on pressure; there were one or two minute petechial spots scattered about trunk and limbs, there was some dark red blood oozing from the anus, and, on movement, the child vomited a dark thick fluid. The treatment adopted was absolute rest, cold water in sips by the mouth, and min. v. of a 1 in 20,000 solution of adrenalin chloride every two hours, which was subsequenty increased to every half-hour, and later on still to 1 in 10,000. The hemorrhage from the bowel and mouth continued for three days, not stopping suddenly, but the motions becoming gradually less frequent and darker in color, until the blood ceased. At first almost everything given by mouth was rejected, even the cold water, and each time before the bowels acted the child would moan as if in pain. When hemorrhage ceased the child was exceedingly anemic—the lips, gums and palpebral conjunctiva being perfectly white. As soon as there appeared to be a cessation in the hemorrhage and vomiting the child was put to the breast and took it well, the quantity allowed at first being very small and increased gradually. Two days after the hemorrhage ceased there appeared a slight swelling in the right submaxillary region, which was hard to the touch and very painful. This improved at first, but subsequently spread to both parotid regions, which became very painful and swollen. the child screaming when touched or its head moved. The motions, which had become quite natural, now became greenish in color, although they were not offensive nor increased in frequency; but the child now became unable to take the breast and died on June 28th, *i.e.*, nine days after birth and five days after all hemorrhage had ceased.

On the 3d of July he was called to see the infant child of Mrs. D., æt. 32, which was born on the 1st inst. The baby had just been bathed, and the nurse was putting a binder on when a quantity of dark-looking blood ran out of the baby's mouth, the child lying at the time on its side on the nurse's lap, and then there came a spurt of blood from the anus, principally fluid and dark red in color, but containing a few clots also. From the mouth blood continue to come all the day, and from the bowels it continued until the following morning, when it ceased altogether, and the child was quite well when I saw it on July 29.

Treatment: Cold water and adrenalin chloride, 1 in 10,000, min. v. 2½ hours. This child was undoubtedly premature, being born at the eighth month. Mother had previously three children. Last, seven years before. All well. No hemorrhages or anything like it in the family. Also had trouble with varicose veins in one leg while carrying. On the morning before hemorrhage child suddenly became cyanozed and appeared to choke. Atelectasis. Cord did not separate till the twelfth day. In neither case was there bleeding from the umbilicus.

Upon the Presence of the Typhoid Bacillus in the Urine and Sputum.—MARK W. RICHARDSON (*Boston Medical and Surgical Journal*, Feb. 5, 1904), writes that a review of the literature since 1887 shows that thirty observers have made bacteriological investigations of the urine in 1,291 cases of typhoid fever. Of these, 278 gave positive results: a percentage of 21.5, which approximates remarkably close to his own percentage of 21.35. As to the use of Urotropin—this drug has been used by eight observers in fifty-three cases. All the reports have been favorable except that of Gwyn, who found that, in two cases of cystitis due to the typhoid bacillus, the organisms persisted, though in much diminished numbers, in spite of a long-continued use of urotropin. Gwyn prefers irrigation of the bladder, with corrosive sublimate 1:50,000. Very rarely the use of urotropin has been followed by painful micturition and hematuria. These symptoms have, however, ceased immediately upon the omission of the drug, and no permanent injury to the kidneys has resulted.

Our present knowledge of the subject may be summed up as follows: (1) Typhoid bacilli are present in the urines of about 21 per cent. of individuals afflicted with typhoid fever; (2) The bacilli, when present, are generally in pure culture, and their number is frequently enormous, many millions in each cubic centimeter of urine. (3) The invasion of the urine by the bacilli takes place in the later stages of the disease. Unless measures are taken to remove the organisms they persist frequently for weeks, occasionally for months, and rarely for years, and thus constitute (a) a danger to the patient himself (cystitis and possibly orchitis and epididymitis), and (b), what is much more important, a grave source of danger to the public health. (4) The necessity for the rigid disinfection and supervision of typhoid urines is apparent. (5) In urotropin we have a drug which will, in the vast majority of cases, remove the typhoid organisms from the urine, not only in the cases of simple bacilluria, but also in those in which a cystitis has resulted. Very rarely an obstinate cystitis may require the use of vesical irrigations. Very infrequently a case will be seen in which the use of urotropin is followed by hematuria. In such cases the drug should be omitted and irrigation of the bladder instituted. (6) This subject, in its relation to the public health, is of the utmost importance. In my opinion it should be a fixed rule, and one rigorously enforced, that no typhoid convalescent be discharged as well until his urine has been proved permanently free from bacilli. In large hospitals, with their well-equipped laboratories, such supervision can be carried out with ease. Cases in private practice should be the care of the local boards of health. In this way only can we prevent a considerable percentage of our typhoid convalescents from becoming unsuspected foci for the further distribution of the disease.

Acetonic Vomiting and Tuberculous Meningitis.—The syndrome described by Marfan, consisting in uncontrollable vomitting and acetonuria, is not always benign, for it may mark the onset of a tuberculous meningitis, as shown by the case reported by LEIGNEN and MIRALLIÉ (*Gaz. Méd. de Nantes,* Aug. 15, 1903). The patient, a child of nine years, came under treatment for uncontrollable emesis; all nourishment taken being at once vomited. The breath had a decided odor of acetone and examination revealed its presence in considerable quantity in the urine. This condition persisted for nine days, no nervous symptoms being apparent during that time and the temperature ranging between 100 and 101° F. Upon the tenth day a slight inequality of the pupils was seen; and upon the thirteenth the child complained of headache. On the fifteenth day Kernig's sign appeared and well-marked symptoms of meningitis rapidly developed; the patient succumbing to that disease three weeks after the onset of acetonic vomiting.

The Overlaying of Infants.—So far as Westcott (*The British Medical Journal,* Nov. 7, 1903, p. 1208) has been able to learn, England excels all other countries in Europe in the proportion of deaths of infants under one year of age from suffocation in bed with their parents or nurses. It is certain that an infant may die from gradual suffocation, the usual signs of overlain bodies being bluish lips, a livid complexion, flexion of the legs and arms, clenched hands, and froth, often blood-stained, in the nostrils and mouth. In some cases the author has found the tongue protruded and discolored; the neck and face turgid, the nails blue, the whites of the eyes reddened, and punctiform marks on the conjunctive and eyelids.

Some are overlain by intoxicated parents and some by worthless and criminal parents for the purpose of securing insurance money. And he raises the question, Should it not be declared an obligation on every parent to provide a cot or cradle for the infant's use? He also suggests that a desirable form of charitable institution would be one to provide cradles for the poor and he quotes Dr. Danford Thomas as recommending the poor to obtain an empty orange box. These cases differ from almost all others, he adds, in that the cause of death is not made much clearer by post-mortem examination. Therefore, given the signs of suffocation, the doctor, coroner, and jurors have to decide on the proper verdict from a consideration of the collateral circumstances attending the death. This verdict is difficult to form unless a parent will confess and, he concludes, the truth is that it is impracticable to secure conviction for the manslaughter of infants by overlaying at the present time in England. If some punishment were instituted deaths from carelessness would become rare by the frequency of a successful prosecution.

Some Suggestions in the Management of Children Predisposed to Phthisis.—Dr. Albert McConaghy's advice to this class of patients is as follows:

1. On arising, take a glass of hot or cold water.
2. Breathing and other exercises in a well-aired room.
3. A regular time for stool immediately after the exercise.
4. Cold bath, with vigorous rubbing upward of the body.
5. Play in the sun one hour every day.
6. Encourage proper carriage of body, chest upward and forward, abdomen drawn in, arms hanging loosely.
7. Cultivate habit of deep breathing on the street.
8. Sleep on a hard bed and without a pillow.
9. Limit the child's studies.

He draws these conclusions from the consideration of a typical case, and holds that it is possible for a person to exercise his whole body, to keep it strong and well, simply by breathing properly. As every delicate child has a repugnance for any form of discipline and exercise, it is necessary to get the support and hearty co-operation of the child's parents, which will be easily obtained if the latter are informed of the child's true condition.

BOOK REVIEWS

Lehrbuch der Kinderheilkunde. Von O. Huebner, O. O., Professor der Kinderheilkunde an der Friedrich Wilhelm Universität zu Berlin. 1 Band. Johann Ambrosius Barth, Leipzig.

The author, in a very frank preface, has made this book as an offering, as it were, to the commemoration of the opening of the new University Clinic and Polyclinic for Children's Diseases at the Charité Hospital at Berlin.

He sketches very hastily his dream of many years back on what a text-book should be, and offers this in partial fulfilment of his hopes.

We can congratulate Professor Huebner in many ways. He has given a work that is both scholarly and thorough. It is really a marvel of industry, a mine of information, and a philosopher's stone. The first volume alone is offered, but the author believes it to be the more important. It is certainly excellent.

In the opening introductory chapters, the author discusses the development of the child, taking up in regular order the study of the different organ systems and their changes as they bear on the problems of children's disorders. The second chapter deals with the newly born. The third with the nursing child. The fourth takes up the acute infectious diseases, in which we note that chorea minor is so regarded, although a fragmentary reference is alone given bearing on the etiology of this affection. Tuberculosis and syphilis are treated in the fifth chapter as chronic infectious diseases, while the sixth chapter commences to deal with diseases of growth, Rachitis and Barlow's Disease being under consideration.

We can commend this volume most heartily. The style is simple, the language direct, the descriptions very telling, and the therapy sufficient.

A Nurse's Handbook of Obstetrics. For use in training schools. By Joseph Brown Cooke, M.D., Fellow of the New York Obstetrical Society, etc. Philadelphia and London: J. B. Lippincott Company, 1903.

Books written for the instruction of the obstetric nurse alone are but few in number, for most volumes on this subject are popular in nature and do not give sufficient prominence to the physician's standpoint. This defect is remedied by the present handbook, which is thoroughly technical, but still does not overstep the bounds of the nurse's legitimate sphere. The assistance that a skilful nurse can render the medical attendant can hardly be over rated, and the author clearly indicates the most approved and modern methods of performing the thousand and one minutiæ of the lying-in chamber. Nearly one-half of the very numerous illustrations were especially prepared for the work, and even the experienced obstetrician may glean helpful hints from many of the chapters. The section devoted to the nursing mother and the modification of milk is thoroughly modern, and contains much practical information on the care and feeding of young infants. The book is in every way a model and gives evidence of much thought and care in preparation, intelligently directed with a full understanding of the needs of the situation.

Le Syndromo Urinaire Dans La Scarlatine Et La Diphtherie De L'Enfance. Par Le Dr. Ravoul Labbé, Ancien Interne des Hôpitaux de Paris. Ancien Moniteur de Tubage et de Trachéotomie a l'Hôpital Bretonneau. Librairie Médicale et Scientifique Jules Rousset. Paris: 36 Rue Serpente, 1903.

This is an exceedingly complete study of the urine of children suffering from scarlatina and diphtheria. Some of the author's conclusions are as follows: The volume excreted in both diseases runs an increasing curve up to about the eighth to the eleventh day, at which time the maximum is reached. This is not the case in severe forms of diptheria, in which there is no definite rule. The density is in inverse ratio to the volume and the acidity is higher than normal, especially in diphtheria. The indican reaction was obtained in 40% of the cases of scarlatina and in 77% of the cases of diphtheria, being more persistent in the latter. The diazo reaction was present in 40% of the cases of scarlatina, but never occurred in diphtheria. Albuminuria was rare in scarlatina, but was observed in 75% of the cases of diphtheria. Cryoscopic examinations showed that the functional efficiency of the kidneys was but slightly disturbed in scarlatina or diphtheria of medium severity.

PEDIATRICS

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ORIGINAL ARTICLES

A REPORT OF TWO CASES OF EMPYEMA, ONE OCCURRING IN AN INFANT OF TWELVE MONTHS; A CASE OF RUPTURE OF THE SPLEEN; A CASE OF RUPTURE OF THE LIVER.

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I wish first to report briefly two cases of empyema, each of which presents a single point of interest.

Case I. On November 16, 1902, I saw in consultation with Drs. Gamble and Gerhard, an infant, twelve months of age, who was suffering from a well-advanced empyema of the left side. This condition followed a severe attack of pneumonia which began four weeks before I saw the child. Her condition was very precarious during the second week of this illness and the temperature during this period was very high. At the time I first saw the patient the temperature was about 100, respiration about 50, and the pulse too rapid to be counted. There existed also a palsy of the left hand and foot. Because of the baby's serious condition I thought it unwise to remove the fluid too rapidly, and therefore withdrew five or six ounces of pus with a large aspirating syringe. I then quickly, without the use of an anesthetic, made an incision between the ribs and introduced a drainage tube. An enormous quantity of pus escaped, but I did not allow the chest to entirely empty itself before applying the dressing. Subsequently the discharge was very great, but the child's condition improved immediately after the operation. A few days later there developed a pneumonia of the right side, from which the child nearly died. At one time the respirations were as high as 88 and for several days they did not fall below 56. The discharge from the wound continued for six weeks. The palsy of the hand and foot gradually disappeared. Ultimately, the recovery was good, and the child now is perfectly well and both lungs are performing their function satisfactorily.

The interest in this case, aside from the recovery after so serious an illness, lies in the age of the child, twelve months. I never before operated upon a child of this age for empyema and I believe its occurrence unusual.

Case II. The second is that of a boy seven years of age, operated upon at the Polyclinic Hospital for Dr. Hamill, on the 21st of November, 1902. This child had had an imperfect drainage of the left chest done some weeks before admission to the hospital. When I saw him he had an empyema of the right chest and also a pyemic abscess of the right shoulder. His condition was very bad, but drainage of both pleural cavities and of the abscess of the shoulder was imperative. After giving a hypodermic of morphine 1/16 and atropine 1/450, a very small amount of chloroform was administered and both pleural cavities drained by rib resection and the abscess of the shoulder freely opened. Before operation the child's condition was so very grave that I was afraid he might not survive the operation, and therefore worked rapidly, which I think is very important in all cases of empyema. The time consumed in operating on this case was eleven minutes. The patient stood the operation very well, but died several weeks after having been removed to his home. The death was very sudden, taking place just after the dressings had been changed and when the patient was making very good progress. The child died while the doctor who had done the dressing was washing his hands.

I have recorded this case because of the peculiar way in which death took place. We have all been taught the great danger of sudden death from irrigating the pleural cavity, and numerous instances of this kind have been reported. It seemed interesting, therefore, to have death occur suddenly after an operation for empyema when there had never been any irrigation of the pleural cavity.

The next two cases are ones of rupture of an abdominal viscus due to contusion.

Case III. The first is that of a boy operated upon at the Bryn Mawr Hospital on Sunday, June 8th, 1902. The history given was that the boy fell from a tree on the Friday preceding. In a short time he recovered from the immediate shock of the fall and said nothing about the injury when he arrived home. The following morning, however, he was found very much shocked. He was admitted to the hospital on Saturday, but it was thought at this time that he was too ill to be operated upon. I saw the patient first on Sunday afternoon; he presented every symptom of severe intra-abdominal hemorrhage; his pallor was marked, his pulse was rapid and weak and his respirations very much increased. Examination of the abdomen was somewhat distended, with a dull percussion note in both flanks when the patient was recumbent. When he was turned over on his side the upper flank became resonant and the dulness of the other greatly increased. There was no evidence of confined blood in either kidney region nor was there any tenderness here. His urine showed considerable macroscopic blood on the day of admission, but this had become much less on Sunday. There seemed little doubt that the kidney was involved in the injury, but at the same time it was clear that the abdomen contained a large amount of free blood. Although the child's condition was very bad, it was deemed wise to open the abdomen and attempt to arrest the bleeding. In the absence of any particular indication, it was thought that the liver was the most likely seat of the injury, and therefore an incision was made on the right side of the abdomen below the costal border. A quantity of free blood escaped when the peritoneum was opened, but the liver and other organs on the right side were uninjured. The blood appeared to come from the opposite side of the abdomen, and therefore a second opening was made below the left costal border. The descending mesocolon and the peritoneum over the kidney were markedly injected with blood. When exploration was carried upward, clots were discovered, and later a laceration of the spleen which admitted three fingers. The wound was firmly packed with gauze, the abdominal cavity irrigated with hot salt solution, and the wound on the right side closed. When these procedures were completed, it was found that the packing had thoroughly controlled the bleeding, and therefore it was left in position and the wound partially closed. The patient made an uneventful recovery, excepting for a slight left-sided pleurisy, with some effusion, from which, however, he rapidly recovered.

Case IV. The second case was that of a girl nine years of age, operated upon at the Pennsylvania Hospital on October 31, 1903. This child was admitted at 11.15 a. m., having just been run over by a wagon. Her temperature on admission was 99 and her pulse was fairly good. Two hours later, when I saw her, her condition had become very much worse; the pulse was very small and very rapid; her face was blanched and she was very thirsty. Her temperature was between 96 and 97. There was some slight abdominal rigidity and tenderness, which latter was referred to the umbilical region. It seemed evident from the progressive nature of the shock that it was dependent upon intra-abdominal hemorrhage, and I therefore determined to open the abdomen at once. The urine had been drawn and was found to be perfectly clear. It was impossible to tell what organ was injured, and I therefore determined to make my incision near the point of tenderness. The abdomen was opened just below the umbilicus in the median line and this was followed by a gush of dark blood. There were no clots for some time, but finally one or two were evacuated from the right side. The wound was enlarged sufficiently to admit the hand and an examination made of the under surface of the liver. This revealed a laceration against which a large gauze pad was placed. An incision was then made through the right border of the upper portion of the rectus. This gave an excellent exposure of the wound in the liver, which was about ¾ in external to the gall bladder, extending all the way through the thickness of the liver and back for about 3 inches. This laceration was packed with iodoform gauze and the pelvic cavity thoroughly irrigated with salt solution, resulting in the evacuation of a large quantity of blood and clots. When I returned to the liver wound to complete the dressing I found that there was some oozing from the upper surface and in shifting the iodoform gauze pack to control this I must have loosened a clot, for there was immediately a most profuse hemorrhage from the wound which for a few minutes seemed uncontrollable. Finally, however, after repacking the wound itself and placing between the liver and the chest wall a large gauze pad and underneath the liver a number of large gauze pads, the bleeding was apparently controlled. Dr. Mitchell began the intravenous injection of salt solution when I opened the abdomen and during the operation injected seven pints. I attribute the fact that the child was able to leave the table alive entirely to the injection of the salt solution. After the operation she was freely stimulated with strychnia and rectal injections of salt and whisky. I did not expect her to live and was surprised to find her alive the next day. At this time there had been a large amount of oozing which I think was attributable somewhat to the salt solution which I had left in the abdominal cavity, but when the outside dressings were changed there was no bleeding taking place. The child was still very ill, it being impossible to count the pulse, but she was taking a certain amount of nourishment and her condition was certainly hopeful. In spite of this improvement, however, she died on the third day after the operation, apparently from loss of blood.

These two cases introduce the subject of treatment of abdominal contusions, probably one which gives the surgeon more anxiety than any other with which he has to deal, since in so many instances of marked shock and other symptoms, there is no real laceration of any abdominal viscus. Again, as is shown in the case of rupture of the spleen just reported, marked symptoms may be entirely absent for some hours after a severe laceration of one of the abdominal organs. It is impossible to formulate any definite rule of action in these cases, and the surgeon must be guided to some extent at least by instinct. As far as I am able to express my own attitude toward contusions of the abdomen, it is that wherever there is evidence of intra-abdominal bleeding operation should invariably be immediately instituted. Persistent rigidity and localized pain also indicate exploration. It must be remembered, however, always that an abdominal contusion may produce a most profound shock without serious lesion, but these cases in my experiences are those which recover very promptly and in which the symptoms rapidly subside, the patient recovering frequently before the necessary preparation for operation can be made. Progressive shock is the strongest indication we have for operation.

HEMORRHAGIC GASTRITIS IN CHILD—DIFFERENTIATION OF BLOOD FROM TOBACCO.

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In February, 1904, I saw in consultation a boy of 22 months who presented some interesting conditions (No. 81 of 1903-4). The child had always been pale and delicate, though never before seriously sick, and he had been confined to the house during an unusually severe winter for this climate. About a week previously, he had begun to vomit frequently, without any obvious cause in the way of dietetic indiscretions, his diet being the regulation cereal and milk regimen for this age. Indeed, the only criticism that I could offer was that the child should occasionally be given a piece of salt pork or a tender piece of steak or the bone of a lamb chop to suck. Two days before I saw him, he had found some cigarette stubs (Sweet Caporal) which he had swallowed. He was said to have a hereditary fondness for tobacco and to have done this before. It was also stated that he had actually vomited shreds of tobacco and charred cigarette paper. The gastric symptoms had obviously been increased. I was shown a napkin into which he had vomited, as evidence that he was still vomiting tobacco. But, on close inspection, it appeared that the brownish threads were not tobacco, but probably mucus and blood. Small gastric hemorrhages often show themselves in this way or are described as resembling tobacco juice, when there is no suspicion of the patient's having had tobacco (as in Case No. 16 of 1901-2, that of a young woman). Microscopic examination plainly showed red blood cells in the mucus threads and the hemin test was fairly distinct, though not in itself absolutely convincing.

The pulse was about 100, the temperature reached 102, but was usually about 100, during my observation. At the time of the highest temperature, the blood was examined for leucocytosis, with negative result, and the possibility of meningitis and other febrile complications or primary diseases, was considered, but no signs existed which warranted the diagnosis of other than local gastric trouble.

The treatment consisted of physiologic rest for the stomach, rectal alimentation with peptonized egg and milk—not omitting salt—and bismuth salicylate, with counter-irritation over the stomach with a spice bag. I am rather sceptical as to what we can do with counter-irritants, but believe in using them on theoretic grounds. Recovery was uneventful but slow.

The main points of interest in such a case are the etiology and the diagnosis. Ordinarily, we do not expect gastritis of such acute degree as to eventuate in hemorrhage, except from corrosives. Indeed, some authorities do not use the term acute gastritis except as applying to corrosive cases, possibly including those due to alcohol. The possibility was considered that the gastritis might be due to paint sucked from toys or to hard and sharp foreign bodies. Due precautions seemed to have been exercised in regard to the former and no foreign body was found in the stools. It is possible that the gastritis was originally due to tobacco, although the mother felt reasonably sure that the child had gotten hold of tobacco only the once, recently. Thus, the real cause remained unknown. It is questionable whether the hemorrhage appeared before the cigarette stubs were swallowed or not. While the amount of bleeding was small, internal hemorrhage is always potentially serious, and we do not know but that blood was passed in the stools before careful investigations were instituted.

MEDICAL FOLKLORE OF CHILDHOOD*.

By Harriet C. B. Alexander, A.B., M.D., Chicago.

The sociologic factor that has changed man from a gregarious animal to man living in a monogamous family is unquestionably the child. Through the protection by the mother of the child during a comparatively long period, a struggle for existence between its central nervous system and its ordinary physical functions was protracted in favor of the former, albeit not enough to prevent the senile change in this particular which begins at three. The beneficial protection of infancy and childhood which fetishism brought about through its influence on maternal love is now sought in other directions, but the benefit which fetishism exerted cannot now be well overestimated.

At the lowest phase of human culture all conceptions are immaculate,[1] and birth results from a survival of a struggle between spirits for reincarnate existence. Trees and stones are storehouses of such spirits, who dart into the mother from them. Since the fetish spirit of primitive man is neither totally malign nor benign, the babe in which he took up residence might be placated into a benign or angered into a malign being.

The child at this phase is a spirit clothed with flesh by the mother, who as to its fate and training is merely the representative of the anarchic horde, the first sociologic unit.[2] From this view when the significance of human reproduction dawns on the primitive mind,[3] it retains the mystic sacredness[4] which combines the divine and the impure.[5] This conception is one which leads to numerous taboos.[6]

From this "divine-impure" conception results the phase of culture where fatherhood becomes so mystically sacred that the husband must be neither seen nor recognized by the wife. The next phase of evolution is marked by recognition and adoption of the husband into the tribe, but only after birth of the first child. This conception, rather than horror at incest, originated exogamy, or marriage outside the horde, family, or tribe, particularly since prohibition of marriage dealt with totem or mystic ties rather than those of blood. At this phase of fatherhood evolution the child spirit is placated by taboos[7] thrown around the mother during pregnancy[8] and lactation.[9]

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*Read before the 1902 session of the International Folklore Association in outline.

As the fatherhood conception begins to dominate, the mystic aspect of the child devolves increased responsibility on the father, whence the couvade, traces of which remain in Spain,[9] Russia,[9] Corsica,[9] Holland,[9] Ireland,[10] Scotland,[10] Yorkshire, England,[10] and in the mountains of Kentucky, North Carolina, and West Virginia. Under the couvade the husband, on the birth of a child, goes to bed, groans, and covers his head, while his wife "Serves him rich possets in the straw.[11] This placation of the newly-born child spirit is a survival of matriarchy under partly developed patriarchy.[12]

A struggle for incarnate existence results between spirits. Those stillborn or dying unritualized are peculiarly unfit for incarnation through the malignity resultant on their previous failure. Therefore, as in Annam,[13] prospective mothers will not receive anything from the mother of a stillborn or unritualized babe. Among the Todas bows and arrows are buried under a tree two months ere birth by the prospective father and mother, to place the coming babe under the protection of tree genii at its coming birth. Neglect of this results in defective or deformed children.[14]

Stillborn and unritualized babes had, however, usually malign qualities, and hence were buried with burial and other ceremonies, warding off the living from their attack. The savagery of Calvinism toward unbaptized babes is a survival of this old belief.

The new-born babe is subjected to food or medicine ordeals at birth intended to placate or ward off the spirits seeking incarnation. Decoctions of herbs, insects, reptiles, flesh and blood of beasts and man, based on the doctrines of signature and sympathies, are still almost everywhere forced down the new-born babe's throat as hygienic precautions. Among the Thlinkets the new-born babe is not nursed until its stomach is emptied by vomiting created by pressing the stomach. Among the Hares the babe is not allowed food until four days after birth. The Songishes do not give the child anything to eat the first day. The juice of the ash-tree is, however, usually the first food given in Aryan-speaking countries in the district stretching from the Scottish Highlands through Spain and Russia to India. From this, as has already been shown, evolved the child's cathartic, manna.[18] Through evolution by atrophy this ash juice took forms other than that of manna. In Donegal, Ireland, new-born babes are forced to swallow whiskey, and immediately thereafter suspended by the upper jaw on the forefinger of the nurse. Whiskey here represents the Hindoo soma, the sacred ash juice, etc. Administration of alcoholics to the new-born, quite common everywhere only a few decades ago, arose from this. A more significant placation occurs among the Todas.[14] Immediately after delivery, which always occurs in the open air under the tree whose genii have been propitiated, three of its leaves are presented to the father. He makes therefrom cups, and then pours a few drops of water into one, moistens his lips, and decants the remainder into the other two cups.[14] The mother drinks from one, giving the water in the other to the babe. The mother and babe remain for four weeks under the tree, while the father goes home. When the babe and mother return home, the father leaves it for four weeks. Here is discernible the primitive couvade evolving from the union of father, mother and new-born child under protection of the previously propitiated tree genii.

Totemic taboos arose through a variant of the doctrine of signatures which, by onomatopeia, made animal-like qualities descend from animal ancestors. The Ainos of Japan, a Caucasic race of marked hairiness, reverence the bear as an ancestor, apologize for killing it, and hold festivals in its honor. On totemic ideas of this type were based beliefs Pope crystallized into:

So watchful Bruin forms, with plastic care,
Each growing lump and brings it to a bear.

An Alemannian lullably sung to a child while washing and combing is:

I am a Pumpernicklin,
I am a bearikin;
As God shaped me
I wiggle about.

Under the Aino and allied animal beliefs massage and bathing given the new-born babe were charms, as the Alemannian lullaby denotes. An English survival of these totemic practices appears in the phrase "an ill-licked cub" applied to a badly trained youngster.

A practice not without hygienic value which thereby arose in fetishistic folklore is as stated the massage of the new-born infant. Among the Songishes the mother rubs the child as soon as it is born from the mouth towards the ears, so as to press the cheek-bone somewhat upward. The outer corners of the eye are pulled outward so that they may not become round, which is considered ill looking. The calves of the legs are pressed backward and upward, and the knees are tied together to prevent the feet from turning inward. The forehead is pressed down. Immediately after birth the eyebrows of the Kootka infant are pressed upward; its belly is pressed forward, and the calves of the legs are squeezed from the ankles upward. These manipulations are believed to improve the appearance of the child.

The pressing of the eyebrows upward fulfils the ideal of beauty found in the carvings of the Indians of Alaska. The squeezing of the legs is intended to produce slim ankles.

Another phase of this is the practice of deforming the skull. This is found among races as widely separated in culture as the Flathead Indians, the Normans, and the Bretons. A survival of these practices lingers in the game[18] which nurses play on the babies' features. This consists of touching nose, mouth, eyes, etc., giving a caress or slap to the chin and repeating at the same time the verse:

Eye winker,
Tom Tinker,
Nose dropper,
Mouth eater,
Chin chopper.

Similar rhymes to this occur in all European tongues.

Any departure from the usual in births was a result of an irregularity in the struggle for incarnation between spirits, and hence uncanny presentations, positions, twinning, and multiparity assume in folklore supernatural aspects. In twin folklore appears the interchangeableness of the ideas of sacred, lucky, terrible, and unclean, which so frequently survives from primitive culture in civilization. A very decided survival of spirit reincarnation belief recently appeared in British Guiana among the Arawaks, who are peculiarly gentle toward children. In 1901 an Arawak gave birth to twins. One of the children died. Some time afterward the mother and the surviving child became ill. A "marinow" or a "paiman" was called in as "medicine man." After an incantation he decided that the child's father was not the husband, but an evil spirit; the child was not a human being, and therefore must not be allowed a natural death; the mother was unfit to be a wife any longer; and the husband should burn them behind a mountain two miles from the village. The husband, devoted to his wife, delayed to carry out these orders for three months. The "marinow" then burned down his own house and left the immediate neighborhood. On several occasions he sent to urge the husband to burn the woman and her child, lest the evil spirit who was the infant's father destroy the village. At length the distressed husband placed his wife in a basket, took her into the forest, and after he had put her into a hammock, kindled a large fire under her. Returning, he buried the bones, and some time later he took to the forest. During his absence women in whose care the babe was left carried it into the bush and burned it on a wood-pile in obedience to the orders of the "marinow."

Between this phase and the benign, connecting links occur in Africa. Among the Ishogo, twins are practically isolated and under taboo until grown. In Unyoro, while twins are lucky for the community and great feasts are held in their honor, still if they die the house in which they were born is burned down. Here appears the fetishistic dread of the spirit irritated by death.[16] The parents of twins are "holy" among the Obahers. The father of twins becomes a priest alternate among the Kaffirs. A twin boy has all priestly advantages. If any one kills a twin his whole village is destroyed. Here survives the fetishistic dread lost in seeming sacrilege.[17] Among the Songishes of Vancouver twins when born are supernatural and (a special ritualization) must be washed in a pond to become ordinary men. Among the Suchwaps the supernatural element remains throughout life.[18] A transition from the malign to the benign likewise appears in the Essex, England, belief that "a left twin," or a child which has survived its fellow twin, has the power of curing the thrush in a girl by blowing three times into her mouth. Among the Kwakiuti of British Columbia, twins are able to cure disease by swinging a rattle. In Liberia (Africa) they possess great healing powers, for which reason most of them become doctors.

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A DISCUSSION ON THE CHARACTER OF MILK SUPPLIED TO CITIES.

(Continued.)

III. THE CONTAMINATION OF MILK.

By Rowland G. Freeman, M.D.

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(Dr. Freeman exhibited stereopticon views which he described as follows. His lecture was arranged for a general audience, and it is not practicable or necessary to reproduce the illustrations in a technical journal. His remarks were suggestive and are well worthy of publication in Pediatrics *and of the attention of physicians.)*

The quality of the milk supply in any community is of vastly more interest to the physicians of the community than to any other class. These physicians have to feed their patients largely on milk. The physician is accountable for the welfare of these infants and adult patients, and unless he can be assured of a pure milk supply for the feeding of the children and invalids under his care the results are uncertain and often serious. It is therefore of the greatest importance to physicians, and particularly to those who make a specialty of the care of babies, that they have at their disposal a pure milk supply. This movement for dairy hygiene, due largely to the men who make a specialty of pediatrics, has been brought about in the first place through the milk commissions. A great deal, of course, is due to dairy experts, and especially to Professors Pierson and Conn and Russell, but to the medical profession we owe most, and especially to Dr. Coit, of Newark, and Dr. Rotch, of Boston, through whose efforts the Walker-Gordon Laboratory Company was organized.

The very large bacterial content of ordinary commercial milk and the high mortality of infants fed on such milk gave rise to a demand for clean milk, which was further emphasized when it was found that by simply sterilizing the milk the mortality of infants was materially reduced. The infant mortality caused by summer diarrhea in New York has been reduced over fifty per cent. since the general sterilization of milk has been undertaken. These facts have led some to ask, Why should we sterilize dirty milk, why not have clean milk? This is a proper demand, but it is most difficult to comply with this. We have no dairy routine that is at the present time practicable that will give us milk free from bacteria, and for this reason the sterilization of of milk for infant feeding still seems desirable.

The bacteria that occur in milk are of two classes; in the first place the ordinary air bacteria which are the ordinary bacteria of milk. These are not harmful to healthy persons but are found to cause irritation in infants and sick people. The bacteria get into the milk in a number of ways, most often from the dropping of dust and dirt from the belly and udder of the cow. Some are washed in from the hands of the milkmen and from the teats of the cow. Some fall in from the clothes of the milkmen. Others get into the milk from unclean utensils. Again, when milk is not cooled rapidly there is a large increase in bacteria through reproduction.

In the lantern slides I shall show a number of photographs of Petri plates. These plates are sterilized so that they contain no bacteria. When we wish to determine how many bacteria a specimen of milk contains we mix a measured amount thoroughly with some sterile culture medium, and this sterile mixture we pour into one of the plates and when it becomes cool it forms a solid mass on the bottom of the plate. We have then a sterile medium and the only bacteria present are those in the milk. These multiply, forming what are called colonies, which we can count, ascertaining approximately the number of living bacteria in the milk. To ascertain the number of bacteria in the air we may remove the cover of one of these sterile plates containing sterile culture media for a certain period and later count the number of colonies of bacteria that appear in the plate.

The first slide is to give an idea of the very large area which supplies the milk of our large cities. The supply of New York City comes from five States and from the uttermost limit of New York. Westchester county supplies considerably less than Oneida. Even Jefferson county supplies two thousand two hundred quarts a day to New York City. Now this milk which comes from these distant places is twenty-four hours in transportation. It leaves these places one night, reaches New York the next night and is delivered in New York the second day. The milk that is delivered in New York bottled comes mostly in the bottles and is not manipulated in New York City.

The next picture shows the territory which supplies Boston with milk, and you will see that it is adjacent to the territory which supplies New York. In Boston they have a higher standard than in New York, requiring four per cent. of fat. This high standard has resulted in the fact that nearly all the milk there is brought in by five companies and mixed in vats, and thus the poorer milk is brought up to the standard. I am rather inclined to think it is a disadvantage, because every manipulation which milk undergoes is apt to increase the number of bacteria it contains.

Here is a picture intended to represent what milk looks like under the microscope. You see these little fat globules everywhere.

There are a great many varieties of bacteria in milk, and this sort here is the streptococcus, which occurs not uncommonly in milk. It is the cause of an udder disease, garget, in cows which is very common.

Here we have a photograph of the diphtheria bacillus, an organism which has caused by its presence in milk a number of very serious epidemics. In one instance a number of cases occurred among those using the milk from a certain dairy and when they came to examine the workmen none of the men were sick, but on taking cultures from their throats they found two whose throats contained diphtheria bacilli and it was found that these men were engaged in washing bottles which had been brought from houses where there was contagious disease. Whether these men had gotten the bacilli from these bottles or not was not known, but it seemed to make a possible chain of evidence.

Here is a photograph of some cholera bacilli. There has been one quite serious epidemic of cholera due to the cholera bacilli in milk. This occurred in India from diluting milk with water containing this organism.

The persistence of certain species of bacteria in the milk of some dairies is quite interesting. We have here some colonies from the milk of one dairy and every sample for ten years has contained these bacteria.

The organism in milk that has probably caused more disease than any other is this one, the typhoid bacillus. There has been a large number of very serious epidemics of typhoid due to the presence of this organism in the milk. One of the worst occurred in Stamford, Connecticut, in 1894. There were three hundred and eighty-six cases and all but ten among the customers of one milkman, and this chart shows the route of the milkman in purple, the red dots being the houses in which the typhoid occurred. It is interesting to note how these cases of typhoid fever occurred only along this milkman's route.

Here is a picture of a healthy robust cow, which I show only as a contrast to the next picture, which shows a cow in the last stages of tuberculosis. This tuberculosis in cows we believe to be one of the greatest dangers in ordinary commercial or raw milk. Most authorities in this country feel that tuberculosis in cattle is a great danger to the human race.

Here we have a photograph of some of the tubercle bacilli taken in sputum.

In connection with this matter of tuberculosis a very interesting experiment was undertaken by Dr. Pierson, of Philadelphia. He fitted up two stables in the University Veterinary School to show the contagiousness of tuberculosis in cattle under different conditions. In this stable here he placed six cows, two of which had tuberculosis and four of which were healthy. This stable had only three thousand cubic feet of air space and few windows and was in every way a very unhygienic stable. The next picture shows a clean stable. This stable had nine thousand cubic feet of air space and plenty of light and was kept scrupulously clean. He found after seven months that the four healthy animals put in the dirty stable all had tuberculosis of a fairly advanced stage, whereas in the clean stable only two of the cows showed any tuberculosis and that in a very mild degree. This experiment shows the great importance of cleanliness and fresh air and light in overcoming this tendency to tuberculosis.

This picture is taken to show the very unfavorable position of the udder in the matter of getting clean milk, the udder being placed underneath the cow and in such a position that when the cow lies down the udder is against the ground, so that when the udder is shaken in milking a considerable amount of dirt falls from it, as is shown in this picture. This plate was exposed out of doors, this one in the barn and this one under the cow. The one exposed out of doors showed only six bacteria, the one exposed in the barn showed a little over a hundred and the one under the cow showed one thousand eight hundred.

Here we have the ordinary milk pail, which is a pail with a very large opening. You will notice that the opening is some twelve inches in diameter and perhaps more. That gives ample space for all this dirt from the udder that is shaken off during milking to fall into it. That such a large opening in the pail is unnecessary is demonstrated by such a picture as this, where an expert milkman is milking into the mouth of a cat. This suggests the possibility of milking right into the bottles in which the milk is delivered. The reason this is not feasible is because the first milk is very poor and the last very rich, so that some customers would get poor milk and others almost all cream.

Here you see specimens of the very first milk and the very last, the latter showing about one-third cream.

In order to diminish this contamination of milk a number of experiments have been made with different kinds of pails. Here is a milk pail that is used on one farm and which has been copied considerably in other places. It is a pail with an opening looking upward which is about eight inches in diameter and which has a strainer in it. The man who contrived that had an erroneous idea that the foam which formed on the strainer might filter out some bacteria. This, I believe, is a very bad pail because the opening looks upward. A good pail ought to have the opening looking sideways as much as possible instead of upward. Here is a pail that was tried in which there are two very small openings. This pail, however, was not found to be practicable. The ideal pail is a pail of some such sort as this with the opening looking outward. These pails were found impracticable because they were too large and awkward for the men to use. The pail that I believe now to be the best pail is something like this. It is an ordinary eight to ten quart pail and on this we have made little hoods. The men, in using these pails, hold them so that this hood is slanted, and there is little chance for perpendicular droppings. This seems to be altogether the best pail and eliminates a considerable amount of contamination.

Another source of contamination to milk is from the udder of the cow. The udder of the cow has very large ducts in it and it is on account of these large spaces, probably, that we get this poor milk at first and the richer milk afterwards. Some contamination with bacteria from the udder is very common, but the greater part of the contamination comes from the lower part of the milk ducts, there being less from the upper part. In a considerable number of experiments I have found that the cows that show the largest contamination are the ones with leaky teats, that is, teats from which some milk escapes when the udder is full before milking.

We have here a set of plates showing how this contamination of the udder persists even to the last milk. These are from the milk of a cow that had a leaky teat. Here we have a great many bacteria in the milk from the first squeeze of the teats and a diminishing number from the tenth, twentieth and thirtieth squeeze and very few from the fortieth.

This is a picture taken to show what wet milking is. It is a common practice in many dairies for the milkman after he gets his pail in place to lubricate his hands by milking first into the palm of one hand and then into the palm of the other. That forms a greasy material which perhaps causes less irritation of the teat but results in a serious contamination of the milk. It washes the dirt from the milker's hands and from the teat of the cow into the milk pail.

One of the most dangerous sources of disease in milk is a bad water supply, and we have here a picture of the ordinary farmyard with the manure all about and the well beneath the yard. Such wells are of course in great danger of contamination. Here we have a picture showing how this contamination takes place.

Here is a well on a farm that was a great nuisance to everybody concerned. It was close to a dairy building and shed and near a public road. This was the farm of a milkman. The man was perfectly willing to put in a great many modern improvements, but we could not get him to do anything with this well. Fortunately, however, his business got so large that this well ran dry and he was compelled to put in a driven well.

Here is a well that I think is an absolutely ideal well. We wanted to have these people put in a driven well, but they were afraid they would not get water enough and wanted a dug well.

To protect the water the well was cemented inside and outside, the well was covered and a fence built around it and the gate kept locked, and in this little box was kept a pair of overshoes which the men put on before they went inside, so as not to track any manure in.

This plate shows the necessity of keeping milk cool. In addition to careful handling it is necssary to keep milk cool in order to prevent the multiplication of the bacteria in it. In this case four test tubes from the same milk were prepared and left for twenty-four hours at a temperature of forty-five degrees, fifty degrees, fifty-five degrees and sixty degrees. You see the comparatively small growth of bacteria in this sample at forty-five degrees, but when we come to the warmer temperatures we find a very considerable growth.

This plate here shows the change that takes place in milk with the rising of the cream, a matter of considerable importance. When cream rises from milk it carries with it a large proportion of the bacteria in the milk.

Here we have a specimen of mixed milk, and here is a specimen of the lower milk and the risen cream. Almost all the bacteria in this bottle of milk were in the cream, showing the great necessity of sterilizing the cream.

Here is a picture of the work at a milking house. This shows a room in the basement where the men all wash their hands before going up to do the milking.

This picture represents the method this man had of transferring his pails of milk from the barn to the building where it was bottled. He had an overhead trolley and these large cans by means of a windlass, were run down to the dairy building. It is very desirable to get the milk to the cooler as soon as possible.

Here is a picture of the bottling room. Here is the sterilizer.

Here is a picture of the Walker-Gordon dairy at Plainsboro, N. J., when it was first started, several years ago, with three cow stables and a dairy building. It has been considerably changed since.

The next picture I took there about a week ago and shows the growth of this plant. There are now seven cow stables. Here is a picture of one of the stables. These stables have a row of windows and over each window is a ventilator. The result is that in these stables there is very little animal odor and plenty of fresh air.

This picture is taken to show one great difficulty in this dairy routine; that was the problem of keeping the cows clean after they were groomed. As soon as the cows were groomed they were in the habit of lying down. It was very difficult to persuade the dairymen to hire boys to keep the cattle up. An ingenious laborer at one farm devised a method of keeping the cows standing by means of these chains which are hooked across the stanchion under the cows' necks before they are groomed. It is simple, inexpensive and effective.

This picture shows an arrangement for carrying off the manure by an overhead railroad. It is immediately distributed on the soil, so that there is no manure pile on the place.

The practical question, what good does all this do? may be answered to some extent from this set of plates. For several years I had milk sent to me which was milked into the bottles. This lower plate shows some of that special milk which was sent to me at that time. The plates were planted from milk from certain farms and from some of the large New York supplies, and the middle one from ordinary grocery milk. It is notable that the milk from single farms contains few bacteria, while the larger bought up supplies contain a great many.

In visiting the farm of a gentleman who is a college graduate I found that he had installed a sterilizer and was sterilizing all his utensils very carefully, but after sterilization they were set out to sun by a dusty roadside, thus affording opportunity for contamination and eliminating all possibility of getting clean milk. This milk contained only six thousand bacteria when it left the cow. Each manipulation added a great many, so that in the milking room one hundred and seventy thousand were present.

An ingenious Irish gentleman has devised a patent milker known as the Thistle milker. By means of this he proposes to milk by exhaust. The way it is worked you will see in the next picture. This was found impracticable because of the impossibility of keeping it clean.

This is a picture of the Straus Milk Laboratory in New York.

These plates show what happens from the pasteurization of milk. The pasteurization of milk usually makes a plate that shows no colonies in one day, but in about ten days you can usually get a number of colonies.

IV. DISCUSSION.

Dr. Craig: It seems to me like spoiling the flavor of a superior dish to endeavor to further season the remarks of the gentlemen who have preceded me with any discussion. I want a minute, however, in which to express my sense of personal pleasure in listening to the able papers which have been presented here to-night on the subject of clean milk, and to commend the practical suggestions made in these papers. The gentlemen who have just spoken are not strangers to us. We have learned of the labors of Dr. Pierce and Dr. Freeman through their communications to the public in the technical press. And Professor Harrington has given us a standard work which he has aptly called "Practical Hygiene," and to which we turn with a feeling of confidence, whenever we are in perplexity as to any detail of sanitary procedure. This book is so practically helpful to us that when we want to know what a proper standard of milk fat should be or what the significance of the solid constituents of milk is, we have only to turn over the pages of his book to find the standards adopted by the most competent authorities.

I regret that there is so little time remaining to us for the discussion of these papers, much as I should like to do so. Two things, however, I would like to say in a merely suggestive way. One of them is this: It is often asked why it is that milk is the food particularly selected for investigation and for all this agitation, and why it is that committees of county societies and agriculturists and public spirited citizens go before the public in an endeavor to arouse public sentiment under the influence of which there will result an improved milk supply? Why are not other forms of food selected also? Everything that we eat, the air we breathe, the water that we drink, has more or less contamination of one kind or another, some of which contamination is, at times, harmful to the human organism. An enlightened public sentiment is now demanding healthful water supplies in all the communities of the State. And aside from this, almost all forms of food are eaten in a cooked condition, the bacterial contamination being destroyed during the process of preparation. But with milk the conditions are different. Milk is usually taken in a raw condition, particularly by infants, so that it is a matter of supreme necessity that the milk should be of a high grade of purity. It is particularly because of the importance of pure and clean milk as an infant food that this subject is now emphasized. In fact, until very recently the question of milk supply has been neglected. There is some difference of opinion as to whether the pasteurization of milk or its sterilization is a good thing, so far as public health is concerned, particularly for the preparation of milk for the babies' stomachs. Very many physicians of reputation think it is not. It is easy to see, therefore, that it is a matter of great importance that the milk standard be high or public health suffers. A pure milk means a lessened infant mortality.

The other suggestion is this: There is abundant experience to prove that a public health officer, who goes out to execute some arbitrary law in a purely arbitrary way in opposition to public sentiment and against its business interests, is going to meet with disaster. Professor Harrington speaks with great authority upon this matter, and I do not know how he could speak with such accuracy unless he has had much experience in dealing with the public in the execution of law. There is a small class of reformers who expect to cure all human ills by appealing to the Legislature for the passage of arbitrary law, after the passage of which they expect some public official to go out in the same arbitrary way and execute that law whether it is in the matter of milk or any other article of food or in connection with any other public measures. Such means of correcting prevailing customs, however injurious to the public interests and health they may be, are doomed, in my opinion, to fail. I wish to emphasize the remarks of one of the speakers of this evening, that "it is necessary for any public official to have public opinion behind every important public movement, and that without it no execution of the law can be permanently successful." I do not wish to be understood as saying that law and arbitrary law is not useful in the institution of public reform. Such law is indispensable to the carrying into execution of sanitary or other measures. I do wish to be understood as saying, however, that an appeal to such law without public sentiment behind it is rarely successful, for any length of time, in producing lasting reforms.

By way of illustration, I wish to say that it was my pleasure two or three years ago to deliver a lecture in connection with a postgraduate summer course carried on in the Albany Hospital. The subject of this lecture was "Modern Methods of Quarantine," and in the lecture, among other things, a system of postal card certificate returns for the contagious diseases, scarlet fever and diphtheria, which had been introduced into Albany and accepted by the profession of this city and found to work admirably in producing a diminution of contagious diseases, was recommended for general adoption. As a result of this recommendation, such rules were put into execution in several near-by localities. There has been no question, in my mind, that the mortality of these contagious diseases has been remarkably diminished by this method of maintaining quarantine. After a period of time this system, adopted and carried into execution in these places, failed longer to meet with the approval of the public, with the consequence that this method had to be abandoned. The necessary public opinion was not behind the public officer, and a seemingly wise sanitary measure had to be abandoned. A favoring public opinion must be regarded as a necessity to any successful movement looking to providing pure milk for the public. In the incidental discussion of this matter with Dr. Shaw, whose labors, together with those of Dr. Boyd, the chairman of the committee, and Dr. Pearce, are certainly to be favorably commended, it was considered wise not to attempt the prosecution of men who were furnishing a low standard of milk to the public but rather to seek, through an enlightened public sentiment, the creation of a demand for good milk from those who were willing to furnish a high standard of this commodity. The result has been to increase the amount of good milk consumed in Albany. I think this is one of a number of factors that has been at work in producing the constantly diminishing death rate in this city for the last three, four or five years.

To sum up my ideas as to the conditions necessary to provide a better milk supply for cities, the more practical points have seemed to me to be that we must deal with this subject, on the one hand, from a commercial standpoint, and upon the other in accordance with the dictates of charity.

In the first place, this matter of the supply for pure milk must be reduced to a commercial basis, after which an enlightened and educated public sentiment will purchase only such high grade milk, and competition will quickly dispose of all inferior milk supplies. At the same time the public officer will then be in a stronger position to materially assist in the permanent purification of this most important article of daily food consumption. Even now capital is becoming directed towards this end, and in several places the public are, as a matter of business, offered a high grade of milk at the prevailing price. Capital so invested will be sedulous in guarding its own interests and in limiting competition in milk below reasonable standards. It is easier to control a single milk station with proprietary interests in the municipality than to inspect and properly regulate the standard for a very large number of individual dealers, each of whom has a source of milk, at all times, many miles from the place of consumption. This so-called "trust" milk must compete in price and quality with the ordinary milk that has heretofore been delivered to the public, and in this way only, I believe, can we succeed in having a properly standardized milk eventually adopted for public use.

The other method of supplying standardized milk is through charitable organizations. This method, of course, is applicable only among the very poor and must be limited to organizations supplying real necessities of life to indigent persons. The larger death rate from diarrheal diseases, during the hot summer months, occurs naturally among neglected children fed on unclean and impure milk. A large field of usefulness is therefore open to those organizations in supplying so great a necessity to these needy people. Such needs can be supplied at a limited expense. The various charitable organizations in this city are recommended to open milk stations where a clean and high standard milk can be supplied to the poor at a minimum of cost. And in connection therewith, schools of instruction should be arranged in which the care of milk, particularly for infants, should be thoroughly taught in a practical way.

I have been much interested in this subject of standardized milk and should like to discuss this question more at length, but the time is necessarily limited, and I simply mention these few things by way of suggestion.

Dr. Vander Veer: The meeting this evening has been a great source of gratitude on my part, as I have observed the advances made, and interest taken in the subject of milk supply for our large cities.

I remember very well the illustrations in Frank Leslie's for 1857, '58 and '59, when the subject of "swill-fed cows" was under consideration, and there was a great deal of agitation at that time regarding the milk furnished to New York and Brooklyn.

In the course of this investigation it was very clearly demonstrated that this milk contained the germs of disease, and it was believed that tuberculosis was spread, as the result of the use of the milk from such fed cows. The final verdict was the closing of such establishments, but the subject attracted a good deal of attention at the time and its discussion resulted in much improvement as regards milk supplies. Then the war came on, and as we very well know, little more was said upon the subject until the past twenty years, in which time we have seen much progressive improvement.

I served for some ten years on the local board of health here, and I remember very distinctly our efforts to locate the cause and source of some cases of typhoid fever in different parts of the city, which we believed were due to the milk supply. At last we found a milkman who had a daughter sick in the house with typhoid fever. The closet in which the stools, etc., were emptied was not very far from the well, drainage into the water supply took place, the milk cans washed in this water, and the cause of the infection was exceedingly clear. Other cases developed in this family, but the milkman was very prompt in making a change in the water used, and his route became healthy soon after.

I have watched this whole subject, listened to the discussions, read the papers upon the subject of pasteurization of milk, which I am inclined tc think the consensus of opinion is now against, though of course I have not given the subject the attention that the gentlemen who have read these papers have given to investitions along these lines. I remember with much satisfaction an honest milkman who came to me one time and said :, "I have two children sick with diphtheria; what must I do?" He was advised to take the children to the hospital, which he did, and given directions as to the care of milk vehicles, etc., and I am sure no serious results followed. I believe there are many milkmen who are equally anxious to do the right thing, but need some instruction, and I am sure great good will result from the efforts made by our committee in the direction of affording the necessary information. We have great reason to be thankful for the work of this evening. Public opinion must be consulted, and when once thoroughly informed, will do a great deal towards eliminating the source of adulterated and contaminated milk. We owe a vote of thanks to the chairman of the Committee on Milk Supply, who, with the officers of the Society, have been so fortunate as to bring to us to-night such very able speakers, and whose papers have been so exceedingly instructive.

I move a vote of thanks be given these gentlemen from out of town as a recognition of our appreciation of their valuable papers.

Dr. Cook: I do not rise for the purpose of attempting to add anything to what has been said this evening. I have been very highly entertained and have learned much. I probably occupy the unique position of being the only member of the medical fraternity in Albany that is a milk producer and therefore necessarily more or less interested. There have been a number of things said that, if reasoned from the milk producer's standpoint, would probably carry a different idea. One of the speakers started out by saying that he was going to speak from the producer's standpoint. He made the remark that certain reforms could be carried on in certain dairies with an expense of not more than half a cent to a cent and a half a quart additional. When I say to this audience that up to the last year or year and a half, owing to the failure of the cereal crop in the West, lots of milk came to the city of Albany in the summer time at a cent and a half a quart; when you understand that the wholesaler buys his milk at one and one-half cents a quart, you will realize the necessity for the producer to economize in every way in order to carry along his dairy and make ends meet.

For six years previous to the change in the character for second-class cities I was a member of the local board of health, and during that time we attempted to regulate the sale of milk in the city of Albany under restrictions that improved its quality very much, and we made rules and regulations whereby the milkmen taking out a license were made to conform to certain rules that we had established for the sale of milk in the city of Albany, with the penalty, if they failed to comply with those rules, of having the license revoked. We attempted at that time to bring about a test for tuberculosis, but it was a failure, and I was in hopes that the Deputy Commissioner of Agriculture in his remarks to-night would bring up the subject of tuberculosis, and explain the law as it now stands and also as it stood previous to the enactment of last winter. In the first place, I presume you are aware of the fact that a very large proportion of cattle in the State of New York is contaminated and the laws, as recently amended, are still very lax on that question. Albany was a dumping ground to a certain extent through its West Albany connections, for a great many cattle infected with tuberculosis that were not allowed to pass into neighboring States. I know that one of the requirements enforced by adjoining States before they could cross the line was that they must stand the tuberculosis test. We did not have, up to last spring, any test of that kind in the State of New York, and while some physicians hold that there is a difference in the tuberculosis bacilli in the human being, I think the general trend of the profession is to believe that they are communicable. Now, if that is a fact, one of the first things that we ought to look to in the State of New York is to get the cattle in our State on a healthy basis. Certainly we cannot expect healthy milk from diseased cattle. My theory of pure milk is something like this: First, a healthy cow; then proper surroundings; then a clean stable with a proper amount of air space; then a healthy attendant; then clean utensils; then, as soon as the milking is completed, the milk to be reduced to a certain temperature and held at that temperature till shipped. It should come to the middleman in a condition where it has not been allowed to undergo any bacteriological change. Then it should go into a room at a certain temperature, bottled at a certain temperature, and kept at that temperature till it is delivered to the consumer. Then the consumer should be educated up to the standpoint that it should be kept at a certain temperature till it is used. In that way we might have better milk, practically free from bacteria.

The question to the producer of clean milk is a great one. Where a man is running his own farm, and often doing his own work, the milk can be kept almost free from any liability of excessive contamination. But the larger your herd, the more help you have to employ, the more difficult you are going to find it. I think it has been demonstrated that with a small herd you can do it, but with a large herd you cannot get down to the lower standard of bacteriological contamination. The question of a demand for pure milk is one that the public has to be educated up to. It is utterly impossible to-day to sell milk for much more than the price asked by the ordinary milkman. If you ask more you cannot sell it. When it comes to making a success of a large dairy by putting it on higher grounds, I do not believe that Albany is yet educated up to a demand for it. It is probably the work of some years, and the effort is a grand one, but till the milkmen can make it pay they are certainly not going to do it out of their own pockets. When the people demand it they will get it.

The question of a high standard of milk involves to a certain extent the question of different breeds of cattle. In the great milkers, the Holsteins and Ayershires, the fat is not as high as four per cent., while the cattle who have their origin in the islands, like the Guernseys and Jerseys, give a richer milk but are to a greater extent predisposed to tuberculosis. At the time I was in the board of Health we were fortunate enough to get Dr. William H. Kelley, veterinarian, Department of Agriculture, to join in with us and examine some herds, and we found in the very first herd examined two or three head of tubercular infected cattle. From time to time some of the best herds in the country, owned by prominent people, have been tested and because of their tubercular condition practically exterminated. There are very few herds of any extent that would stand the test if examined for tuberculosis. The one fact that deters the State from weeding out tuberculosis is that there is an immense amount of money invested in the dairy business and the State feels that it should bear a large portion of the expense of this money invested in the cattle destroyed and that amount would be so large that it has kept this subject in the background. I remember a few years ago the State attempted to raise the standard, and in the Orange county district they objected that they could not stand it. You want to start first with healthy cattle in order to get pure milk, and then care for it.

A CASE OF HEMIPLEGIA OCCURRING DURING WHOOPING-COUGH AND DIPHTHERIA.

By Henry Fraser, M.D., D.P.H., Aberdeen.

The publication by Mr. Gowring in the *British Medical Journal* of December 26, 1903, of a case of ophthalmoplegia occurring during whooping-cough recalls to mind an interesting case which I had under my care some time ago:

J. J., male, aged 18 months, was admitted to the City Hospital, Aberdeen, on March 31, 1902, suffering from diphtheria and whooping-cough.

History.—Diphtheria had been diagnosed five days previous to admission; whooping-cough had been present for about six weeks.

Condition on Admission.—The tongue was slightly coated; the throat was reddened and congested; a yellowish-gray membranous deposit partially covered the right tonsil; the submaxillary glands, more especially those on the right side, were enlarged. The breathing was labored. Examination of the lungs detected the presence of some medium rales. The heart sounds were weak, but there was no valvular incompetence. The pulse was soft, compressible and feeble; the temperature was 99° F., and the urine normal. Bacteriological examination confirmed the diagnosis of diphtheria.

Treatment.—Two thousand units of antitoxin were injected, and tinct. digitalis (mj) and tinct. ferri perchlor. (miij) directed to be given every four hours.

The child passed a quiet night and next morning (April 1) seemed better.

Onset of Hemiplegia.—At 3.30 P. M. that day he had a slight attack of coughing; no whoop was heard, but a convulsion occurred which for some minutes looked serious, then gradually subsided. Soon afterwards it was observed that the lower part of the right side of the face, as also the right arm and leg, were paralyzed. The eyelids were now closed and resisted attempts to open them; the conjunctival reflexes were present; both eyes were turned to the left, and movements did not range beyond the middle line; the pupils were medium and reacted to light. The right angle of the mouth was not employed when the child attempted oral movements. The right arm hung limp and flaccid, the right leg was flexed, abducted and rotated outwards; the patellar reflexes were with difficulty elicited and differed in no respect. There was hemianesthesia of the right half of the body, with the exception of the right foot, and the upper part of the right half of the face. Later in the day and during the night there were some twelve fits of varying intensity, lasting on an average from two to three minutes. These fits were Jacksonian in character and began with turning, followed by rapid oscillations of the eyes to the right, next twitching about the right angle of the mouth, and ultimately convulsive movements of the whole body. As each attack passed off there was some coughing with expectoration, then the eyes were turned to the left and maintained there. On April 2 right lateral hemianopsia was noted. The eyelids were now generally kept open. A number of apparently minor fits were observed, affecting only the eyes, which were turned to the right and oscillated rapidly. There were several major fits during the day, and towards evening they became more frequent. Liquid nourishment was well borne, and there were no attacks of vomiting. Ammonium bromide in 1-gr. doses was directed to be given every two hours or oftener if necessary.

After-history.—The fits recurred, though with gradually lessening frequency, until April 6. The temperature was very erratic, at times reaching 103° F., but never for long remaining at that height. The lungs were resonant, and the urine was invariably free from albumen. The diphtherial membrane disappeared three days after admission. On April 6 the child seemed very drowsy and much weaker. The breathing was rapid and shallow, and on April 7 was of the Cheyne-Stokes type. The ammonium bromide was discontinued. On April 11 the patient seemed better. The coughing and expectoration were much diminished, but the Cheyne-Stokes breathing persisted. On the following day the paralysis of the right side of the face was no longer evident. The Cheyne-Stokes breathing was present at intervals until April 15, after which date the child's condition steadily improved. By April 24 the hemianopsia had entirely disappeared; the right arm was at times moved from the elbow joint, the right leg showed no signs of voluntary movement, and on feeding there was no indication of facial paralysis. Sensation had returned in both the right arm and leg; the right half of the trunk was less sensitive than the left. When the child was raised the helpless condition of the right arm and leg was very apparent. On May 3, thirty-three days after the onset of the hemiplegia, the child was, at the mother's request, taken home. The right leg now showed signs of returning power. The right arm was capable of voluntary movement only up to the elbow. Anesthesia had quite disappeared. The mother informed me that prior to this illness the child could talk "wonderfully well;" on the day of discharge he could only utter an inarticulate cry. On June 7, sixty-eight days from the date of attack, save for some weakness in the right arm, recovery was complete. The child walked well, and the mother stated the power of speech was better than before the illness.

REMARKS.

That the hemiplegia was the result of intracranial hemorrhage will, I think, be readily admitted. Diphtheria had first been diagnosed six days before the onset of the hemiplegia, so that, even if we make allowance for the diphtheria bacilli having been present for a longer interval, the possibility of toxic neuritis is excluded. Moreover, the onset of symptoms of, and recovery from, the paralysis were characteristic of a central and not of a peripheral affection.

Whooping-cough had been present for six weeks; during that time the recurrent paroxysms of cough must have exposed the cerebral vessels to considerable strain, which had at length resulted in a rupture, with extravasation of blood. The right hemiplegia, hemianesthesia and hemianopsia, coupled with the Jacksonian character of the subsequent fits, served to show that the lesion was subdural, and that the blood clot extended over a considerable portion of the left cerebral hemisphere.

The fate of this hemorrhagic effusion must remain a matter of theoretical speculation. It may have become absorbed, and the fact that the areas which were presumably pressed on by the periphery of the clot recovered first would seem to support this assumption; it may, however, have become encysted, with adaptation of the brain and skull to the presence of this unwelcome host, and thus have led to the ultimate disappearance of the symptoms of compression and irritation. I regret that I was unable to follow up this case further. It is well known that such children may in time become the subjects of epilepsy, or that their intelligence may remain impaired. Although complete idiocy has been recorded, more often there is only defective mental power or backwardness.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE.—SECTION ON ORTHOPEDIC SURGERY.

Stated Meeting, Held November 20, 1903.

T. HALSTED MYERS, CHAIRMAN.

DISLOCATION OF THE HUMERUS COMPLICATING OBSTETRICAL PARALYSIS.—Dr. W. Whitman presented two cases illustrating the treatment of dislocation of the humerus complicating obstetrical paralysis. The method which he had employed was similar to that of the Lorenz reduction at the hip-joint. This was preliminary forcible manipulation to stretch the contracted parts and reduction by overextension of the elevated arm, which was then slowly forced downward to the side of the body and fixed by means of a plaster bandage. This was retained for several weeks or months, and on its removal manipulation and muscle training were, if possible, begun. In some instances it might not be possible to reduce the displacement at the first attempt. Cases of this character were sometimes classed as true congenital displacement or misplacement of the humerus, but they were, in most instances, secondary subluxations, induced by the habitual attitude of abduction and pronation characteristic of obstetrical paralysis. In certain cases, repair of the injury to the nerve trunks had taken place, and yet the function was disabled, because of the subluxation of the head of the humerus backward, which made supination of the forearm impossible. In such instances the correction of deformity might accomplish a practical cure. In the majority of cases of this character the paralysis was irremediable, yet even in this class the reduction of the displacement improved the attitude and function of the arm.

The first case was that of a girl eight years of age, operated upon three months before. The reduction was successful, the attitude was normal, there was a fair range of motion in the joint, and apparently no paralysis of the muscles. In this case functional cure was probable.

The second case was that of a boy eleven years of age. The extent of the original injury to the nerves was indicated by the atrophy and loss of growth of the extremity. In this case reduction was difficult, requiring several sittings. Now, about one year after the operation, the head of the humerus appeared to be firmly fixed in its proper position. Although there was but little power of voluntary motion in the joint, the appearance and the function of the limb had been considerably improved by the reduction of the displacement.

COXA VARA.—Dr. Whitman presented also a case illustrating the operative treatment of coxa vara. The patient was a girl, ten years of age, who had limped for two years, and had recently complained of much pain and discomfort. The treatment consisted in the removal of a sufficient wedge of bone from the base of the trochanter, to permit the restoration of the normal angle of the femoral neck. A thin layer of bone at the extremity of the wedge formed a hinge, the two opposing surfaces being brought into contact by abducting the limb. In this maneuver the trochanter being fixed by contact with the upper border of the acetabulum, further abduction of the shaft closed the wedge-shaped opening. In this attitude the limb was fixed by means of a plaster bandage, until repair was complete. In the patient presented but slight trace of the former disability was evident, although the operation had been performed in September, the bandage having been removed about three weeks before this meeting.

Dr. V. P. Gibney said that he remembered seeing the operation. He thought at the time that the stretching had not been done sufficiently well to get the arm far enough back to make the reposition, and reduction of the arm where it belonged, absolutely sure. The boy had been kept at the hospital for a long time. After the removal of the plaster, it seemed to the speaker, he had had a little better range of motion than at present. He said all were familiar with the cases presented by the late Dr. Phelps. The open method had been adopted, but he could not quite see how a perfect result could be obtained until the parts could be held in better position, and for a longer time than by the present treatment. He thought Dr. Whitman was working in the right direction, and that by and by a perfect method of treatment for this deformity would be evolved.

Dr. H. L. Taylor said he judged that these affections were secondary to obstetrical palsy, and should be reduced by a system analogous to that employed in congenital hip dislocation. In this case the shoulder seemed to be in good position. There was subluxation of the end of the clavicle, which was not important, though quite prominent. There is limited use, but, as Dr. Whitman had said, it must be remembered that the arms were more or less palsied, and the getting of the head of the humerus into its socket and keeping it there was certainly an improvement in the child's condition, and an improvement over the cutting operation for getting the arm into position.

Dr. Lazinski said that he had been very much interested in the case several years ago when he had seen a number of these children. The condition was then ascribed to injury to the brachial plexus, fifth and sixth roots, paralysis terminating in luxation of the shoulder-joint. If the muscles did not undergo regeneration under treatment or spontaneously, there was permanent disability. The speaker was glad to see such good results obtained by manipulation without any other operative interference.

The Chairman, Dr. Myers, wished to know how in severe cases of these paralyses Dr. Whitman applied reduction. Was it not possible, in some cases, to produce immobilization in this way at the shoulder-joint, and so secure more motion of the arm through the less paralyzed muscles acting on the scapula?

Dr. Whitman said he had studied the hospital reports carefully in thirty or more cases of obstetrical palsy, and had seen the patients come in, all having the well-known attitude belonging to this condition. There was at first no subluxation present at all; it was the effect of the continued pronation and abduction. For that reason Dr. Whitman thought passive motions of great importance in order to prevent such conditions as he had shown. Whether there was paralysis or not, he thought it better to have the head of the bone in the normal position. Then there was power to supinate the arm. In the case of the little girl, Dr. Whitman thought there would be recovery of function, because the injury to the brachial plexus had been slight, but in the other case there would never be recovery, as the injury had been great, as shown by the atrophy of the muscles. There was complete ankylosis of the shoulder-joint. It was better with complete ankylosis to have the head of the bone in its proper place, which was all he had attempted to show. In former times this bad attitude had been allowed to persist; now it was remedied. It was better to do this forcible operation in one, two, or three sittings, thoroughly stretching the parts, than to make a section posteriorly without stretching. Whether or not they could be successfully replaced, and whether they would stay in place, he did not know. He did not present them as favorable cases. Thus far, the bone had remained in position, and function was very decidedly improved.

Dr. Gibney asked Dr. Whitman whether he did not think it would be better to do an excision of the head of the bone in the boy's case, in view of the importance of having it in its proper place, thus giving the patient a more flexible joint.

Dr. Whitman replied that it seemed to him that the atrophy of the scapula and shoulder muscles was very great. The arm was considerably shorter than the other side. He thought excision would be of little use if there were not sufficient muscle to move the arm about. It was a difficult case at the time of operation, and he was obliged to attempt to replace the bone in two sittings. Had been perfectly contented to have complete ankylosis because the attitude was much better. The boy now had partial supination; he had none before. The boy had had no treatment after the operation whatever, except what the mother had been able to give him in the way of massage, etc. He thought in the reduction of all deformity of long standing, the operator should not attempt to do what was required in less than two or three sittings.

Dr. Taylor said he understood the presenter of the case to say the legs had been made in equal length. He was quite sure that the affected limb was half an inch shorter than the other. It was in excellent position.

SUBLUXATION OF THE TIBIA.—Dr. V. P. Gibney reported the case of a boy ten years of age, with marked flexion deformity and subluxation of the head of the tibia, presenting a long ciatrix below the patella. He thought it, on first sight, a case of exsection of the joint in early life, and the usual recurrence of deformity that takes place in those cases. He wished it, however, placed on record as malarial synovitis of the knee, or rather, synovitis occurring during malarial attacks, and wanted to bring up the question as to whether it was osteitis or pure malarial synovitis. Dr. Whitman had operated on the boy, doing osteotomy above the condyles. The leg was now quite straight. Dr. Gibney showed a radiograph of the limb and wished to call attention to the curving of the lower end of the femur which takes place in tuberculous lesions of the bone, and have it compared with the sound limb. The history of the case, in brief, was as follows: Boy, eight years of age. Entered Bellevue November 22, 1900. Family history negative, save for malaria, which attacked all members of the family just before the boy's admission to the hospital. Plasmodia had been found in the blood. At the end of November, 1900, the boy began to have chills, followed by fever and sweating. This occurred every other day. He would have twenty chills, accompanied by nausea, vomiting and diarrhea. Always severe frontal headache. No epistaxis. Looked well nourished but slightly anæmic. Heart normal, slightly irregular. Temperature 102.2—105. On December 11 there was tenderness in right knee and elbow. These joints were swollen and stiff. The tenderness was most marked at the inner aspect of the tibia. The inguinal glands were swollen. On January 8 the joint was still painful. Marked contraction of the leg. Massage and passive motion given daily. Stools fewer, and more normal in character. On January 20 the joint was opened, and the cartilage was found diseased. This was scraped away completely, the bones being intact. The quadriceps extensor was cut out to get the patella out of the way. Suture by chromacized gut. Skin suture with silk. A plaster-of-Paris splint was applied from the hip to the toes. The boy was admitted to Hospital forRuptured and Crippled November 5, 1903, with the deformity described by Dr. Gibney.

ADULT KNOCK-KNEE.—Dr. Gibney described a case of adult knock-knee. The patient was a large Swedish woman, thirty-two years of age. The knock-knee was very marked. Very little history could be obtained. On the inner side of the knee what seemed to be a very hard mass appeared, not distinctly outlined. It was suggestive of osteosarcoma, but the diagnosis was not positive and an X-ray was taken. This showed a much elongated internal condyle, and cuneiform osteotomy was done and the limb was brought around in perfect position without difficulty.

Dr. Whitman said that he thought the bending of the lower extremity at the knee not uncommon in flexion deformity so often seen.

Dr. Taylor related the case of an Italian with obliquity of the pelvis. The man complained of backache, and on examination marked pelvic obliquity was found. Short legs were not uncommon, but the trouble with this man was that one leg was longer than the other, which was normal. The condition was due to an old osteitis of the tibia. One leg was one-half inch longer than the other.

Dr. Napier said that unfortunately the patient of whom he would speak was beyond presentation. The case was one he presented at the April meeting of the section. A boy of fourteen who had lateral curvature with some rotation, beginning Pott's paraplegia. After the above meeting, the boy was ordered to bed. At that time the paralysis had somewhat increased. On Tuesday, April 21, a plaster jacket was applied in suspension. The paralysis had then extended along the legs, and was almost complete. There was nearly complete loss of sensation, loss of bladder control and no movement of the bowels. Temperature normal. The boy was kept in bed. April 22, in the morning, nearly complete paralysis, loss of power in the arms, very little sensation. Involuntary evacuations, temperature normal. During the afternoon the breathing became difficult. At five o'clock, on the 22d, he died of paralysis, apparently of respiration. Dr. Napier reached the house a short time after the boy died. He presumed this case was one of ascending myelitis. He wondered whether the contents of the abscess might not have entered the spinal cord, causing the rapid paralysis.

IMPAIRMENT OF GROWTH DUE TO CEREBRAL LESION.—Dr. Witmer presented this case. Young woman, seventeen years of age, paralyzed since birth. No instruments were used, but the birth was tedious. Injured arm three inches shorter and forearm one and three-quarter inches less in greatest girth than the other. Face and chest on injured side much smaller than the other side. Possibly a marked case of so-called birth palsy. If so, involvement came from fifth and sixth cervical, because the entire arm was affected; the extensors more so than the flexors. Electrical reactions normal. Sensation normal. The speaker thought, because of extreme failure of growth and the fact that reactions to electricity were normal, the paralysis was of the cerebellar or spastic type, rather than of the spinal type. Legs normal. He agreed with Dr. Clark that it was the education of the muscles that was of benefit in these cases.

SPECIMEN FROM A CASE OF MARIE'S DISEASE.—Dr. Elliott presented a spinal column from a patient who had had the disease described by Marie. The patient was first seen by Dr. Elliott in 1897; was then examined under anesthesia for diagnosis. He was suffering from acute pain in the coxofemoral point, with great hyperalgesia. Could not bear the weight of the bedclothes. The hipjoint was found to be ankylosed. He was a Russian, thirty-six years old, admitted to Presbyterian Hospital for pain in knee. Came to this country to avoid army service. Had been examined fifteen years previously, and found qualified, as to size, for a soldier. On admission the the hospital support and extension were applied to the knee, and the symptoms subsided. In one and a half years he returned with pain in left coxofemoral joint, which was ankylosed, gradually extending to dorsal and cervical regions, involving right hip, and subsequently the shoulders to a much less degree. He developed pulmonary tuberculosis. The bacilli were found, and that disease progressed hand in hand with the other. He died from tuberculosis about two months ago. The specimen was almost typical of that first described by Marie in the *Revue de Medicine,* 1897. He described two cases almost simultaneously with Bernhardt, almost indentical in involvement of the larger joints and the hip, all the small joints remaining intact. The curvature was gradual, the symptoms of pain and hyperalgesia subsided, and the man then suffered only from his ankylosed position.

Dr. Taylor said that he had seen many specimens of stiff spines of this general character, but in those he had seen, the ossification was usually more marked on the anterior ligament, and in the lateral bands rather than the median and often on one side more than the other. Cases of spinal stiffness due to ossification of ligaments or to osteoathritis were exceedingly common, but it was only recently that they had begun to be recognized. In Marie's cases the large joints were involved, but there might be osteoarthritis of the spine not involving the large joints and there might be osteoarthritis of the large joints without involving the spine. Sometimes the spine and large joints were affected in succession. Sometimes there was deformity, sometimes not. The result depended largely on the rapidity of the process. If ossification took place rapidly, deformity was not so likely to occur; if slowly, there was equal round-back on both sides, or lateral spinal curvature also.

Dr. Elliott said, in reply to Dr. Taylor's remarks, that in all cases he had seen described under this type the anterior ligaments had escaped, as in this case. There seemed to be two or three different types of stiff spines, and he thought the variety in which the anterior ligaments were involved was the stiff spine in ordinary arthritis deformans, where not only the large but small joints were involved, and there was throwing out of deposit. Here there was no such tendency.

THE PHILADELPHIA PEDIATRIC SOCIETY.

Stated Meeting, Tuesday, January 12, 1904.

DR. D. J. MILTON MILLER, CHAIRMAN.

ENORMOUS HYPERTROPHY OF THE HEART IN ENDOCARDITIS.—Dr. D. L. Edsall reported a case of endocarditis in a child of eleven years, in whom the cardiac disease had existed for eight years and had produced enormous hypertrophy. The interesting point in the case was the presence of signs of compression of the lung similar to those seen in pericardial effusion. The child presented extensive dulness over the lower portion of the left lung and along the spinal column on the right. There were also marked bronchial breathing and the other signs of consolidation. There was no temperature and no other indication of either pneumonia or pericardial effusion. The nature of the pulmonary signs could be demonstrated by throwing the patient well forward and to the right for a few minutes, when the compression was so far relieved that the dullness was replaced by very moderate impairment of resonance, and the breathing became broncho-vesicular.

CASE OF AORTIC ANEURISM OR OF CONGENITAL DEFORMITY?—Dr. Hamill showed a girl of eleven years with signs suggesting aneurism of the arch of the aorta. There was nothing suggestive in her family history or her previous history. Her only symptoms were: dyspnea, cardiac palpitation and cardiac pain. She showed many of the stigmata of degeneration. There was nothing suggestive in the physical examination of the upper air passages. The ophthalmoscopic examination showed nothing having special bearing upon the intrathoracic condition. The right pupil was a little larger than the left.

The suggestive signs were: moderate fullness of the superficial veins of the chest; some fullness in the region of the top of the sternum and under the inner third of the left clavicle, and more marked pulsation in the carotids and subclavians on the left side; some pushing forward of the upper part of the sternum with each systole; less fullness and some delay in the left radial pulse; marked pulsation in the suprasternal notch accompanied by distinct systolic thrill and diastolic shock; questionable tracheal tug; some displacement of the apex beat to the left; absence of pulsation in the abdominal aorta; an area of dullness at the top of the sternum and extending slightly to the right and left; the presence of a soft blowing systolic murmur, a whirring musical murmur beginning late in systole and extending into diastole and a diastolic murmur. The first two murmurs are best heard over the area of dullness, the last being best heard at the xiphoid cartilage and transmitted down to the sternum.

In commenting upon the case, Dr. Hamill said that, while the physical signs were very suggestive of aneurism, he was inclined to consider them as probably dependent upon some congenital lesion of the great vessels.

CYSTIC ECTOPIC KIDNEY.—Dr. Hamill showed also a boy, aged six years, with a mass in the right upper abdominal quadrant. The boy gave a history of having received an injury in this region three years previously by falling upon a curbstone. The pain immediately following the accident was very severe, almost sufficient to produce unconsciousness. Since that time he had had suddenly recurring attacks of severe pain in this region, which were accompanied by high fever, sometimes by constipation and again by diarrhea. He had also passed a few bloody stools. The attacks of pain usually began when the child was playing, and came on with great suddenness. There were no urinary manifestations; on one occasion he was thought to have been jaundiced.

During his stay in the hospital the mass had fluctuated in size. The examinations of the urine were entirely negative. There was no increase in the amount of the urine at the time the mass decreased in size. He had had one or two stools containing blood. He had had no pain since his stay of three weeks in the hospital. His general health seemed good, although he was said to have become considerably emaciated in the past year. His blood examination showed a mild secondary anemia.

The mass, on palpation, occupied the position of a displaced and enlarged kidney. Its posterior aspect was kidney-shaped. Anteriorally it seemed to be associated with the liver. On the one occasion on which it became very much reduced in size, the kidney shape was lost and there was a distinct nodule at the lower end of the mass. The diagnosis that was suggested as probable was a displaced kidney which became kinked under certain conditions and resulted in a cutting off of the ureter and consequent dilation. The bloody stools were reported by an incompetent nurse and her statement could not be accepted as reliable.

Dr. A. A. Eshner said that the clinical history and the physical signs in the second case seemed to indicate that the condition was most probably one of cystic kidney. In favor of this view was the variation in the size of the tumor, its situation, and its lobulated character. As to the other case, the speaker felt that while aneurism was suggested by many of the signs present, it was improbable that this was actually present, particularly as the murmurs were so indistinct. The child presented many of the stigmata of degeneracy; and, while this did not necessarily indicate the existence of congenital anomalies, it was at least suggestive of such a possibility. The condition might be one of abnormal arrangement of the vessels, of embryological origin. The murmur high up in the back was strongly suggestive of some anomaly in the course of the vertebral artery.

Dr. Hamill, in reply, said that he thought that Dr. Eshner must be laboring under some misapprehension in regard to the murmurs. The circumstances in which the child was exhibited had made it somewhat difficult to distinguish heart-murmurs clearly; but these murmurs were quite easily discovered, and seemed to maintain about the same character and intensity.

Dr. J. H. McKee exhibited a case of hydrocephalus of remarkable degree that he had treated by tapping the ventricles, the procedure having been carried out merely for palliative purposes. The child's symptoms, however, afterwards improved to a rather striking extent; and this improvement has persisted.

Dr. J. H. Jopson asked whether in tapping the ventricle Dr. McKee had let the fluid flow until it stopped spontaneously, or had merely taken away what he thought to be a proper quantity and then discontinued the procedure.

Dr. McKee replied that the fluid had almost ceased to flow of itself when inhibition of the pulse was noted, and that the cannula was then removed.

Dr. A. P. Francine read a paper on Diastasis of the Recti Muscles in Rickets, which will be found in full on page 116, February, 1904, *Archives of Pediatrics.*

There was no discussion.

This paper was followed by the address of the retiring president.

THE SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN.

A meeting of this Society was held on December 11, at 11, Chandos street, Cavendish Square, W. Mr. Sydney Stephenson in the chair.

AN ABDOMINAL CASE FOR DIAGNOSIS.—This was shown by Dr. A. Morison. The patient was a boy of nine, who had suffered from an attack of nephritis, accompanied by general edema, albuminuria, and the tube casts. After recovery he was sent to a convalescent home, and there a lump was discovered in the left side of the abdomen, situated low down. The boy said he had been conscious of something movable there for six months. Dr. Morison found a mass in the left iliac fossa which was fixed, and a part above which was movable. He believed the movable portion of the tumor was a floating kidney, which might possibly have become twisted so as to develop the renal symptoms above described.

Dr. Cautley thought that the lump was more or less fixed, that the attack of nephritis was probably unconnected with it, and that the mass was possibly tuberculous.

Dr. Percy Lewis (Folkestone) recalled a similar tumor which led to intestinal obstruction and proved to be a dermoid cyst.

Dr. Guthrie thought there was a movable kidney on the left side, and that the swelling below was probably tuberculous.

CASE OF EXOPHTHALMIC GOITRE.—A girl aged twelve was shown by Mr. Arnold Lawson. The physical signs were all well marked. The chief interest of the case lay in the extreme youth of the patient, very few cases of Graves' disease at such an early age having been recorded. No cause could be assigned for the onset of the disease, the child's health had been excellent previously, and there was no family history of insanity or nervous disease. The constitutional effect of the illness on the child was very slight, although the disease had been in progress for over twelve months.

Dr. Robert Hutchison referred to a case he had seen in a child of eight years, and asked if there was any affection of the pelvic organs, and if early menstruation had occurred. The association of pelvic disorder in women with Graves' disease was a subject well worthy of study.

Dr. A. E. Sansom referred to the case of a child of twelve who had developed this affection after an attack of influenza.

In reply, Mr. Lawson said he had not examined the pelvic organs, but the menses had not commenced. There was no definite neurotic element about the child.

CASE OF MEDIASTINITIS.—A boy of seven years was shown by Dr. E. P. Baumann. Last July he suffered from acute rheumatism, complicated by endocarditis and pericarditis. In September puffiness of the face and ascites developed. There was found to be a large liver and an enlarged heart. The abdomen had been tapped several times, but the evacuation of the fluid made no difference in the venous dilation of the neck. Examination by the X-rays threw no further light on the case. In view of the history and the clinical symptoms a diagnosis of adhesive mediastinitis had been made. The boy's general health was good.

TUMOR AT THE ROOT OF THE TONGUE.—This was shown by Dr. George Carpenter in a girl, aged fifteen years, which was accidentally discovered. The mass was probably a dermoid in connection with the thyro-glossal duct. The thyroid gland could not be felt in the neck, and the possibility of the lingual swelling being a misplaced thyroid was suggested, but that did not negative the absence of the gland in its proper situation, for it was well known that it might be non-palpable during life, and yet be found to be present at a post-mortem examination.

Mr. Francis Jaffrey thought the swelling occupied the site of the thyro-lingual duct.

Dr. Frank Collie (Balham) said he had known the patient for four years, and until one and a half years ago there was no question of any swelling. At the later time she began to menstruate, and two months later a prominence developed in the region of the chin, which might have been due to the effort to get a free passage of air. Two well-known specialists in throat diseases had seen the case, and agreed that it was probably a case of displacement of the thyroid gland on to the dorsum of the tongue. As the child suffered no inconvenience, he advised that it should be left alone.

BOY WITH DOUBLE PELVIC CAVUS.—This patient, aged twelve years, was shown by Dr. Leonard Guthrie. Seven years previously he had suffered from a severe attack of polyneuritis of uncertain origin. At the end of three months he had completely recovered, save that the knee-jerks were absent and there was a tendency to contraction of the tendo Achillis on both sides. He had been admitted into hospital during the present year, suffering from a well-marked condition of talipes equino-varus, for which tenotomy had been performed, with improvement of walking powers. At present he showed a condition of pes cavus on both sides, strongly resembling that of Friedreich's disease, but without ataxy, the knee-jerks were absent, the muscles of all extremities were small, but there was no paralysis. He was somewhat deficient mentally. After excluding other possible causes of the condition, such as spastic paraplegia, Friedreich's disease, polio-myelitis and myopathy, Dr. Guthrie concluded that the case illustrated the after-effects of polyneuritis.

Dr. James Taylor agreed with the diagnosis, and suggested that there had been six years ago some general toxic condition. This had not only affected the peripheral nerves, but also the anterior horns of the cord and the highest cerebral centers. This had caused the impaired mental condition which was now present.

Dr. Fletcher Beach thought that there was defective moral control, probably the result of the early illness.

Girl with Heart Disease.—This patient, aged eleven years, was also shown by Dr. Guthrie, who regarded the physical signs as those of aortic valvular disease, with stenosis. The maximum of the intensity of the murmur was in the second left intercostal space.

Dr. Theodore Fisher (Bristol) said that disease of the aortic valves, either congenital or acquired, was not so rare as was usually supposed. A variety of lesions affecting the aortic valves was found on post-mortem examination.

Various diagnoses as to the cardiac condition were given by members, including mitral disease, aortic regurgitation with presystolic thrill and murmur (Flint's murmur), pulmonary disease, and patent ductus arteriosus.

A Dermoid Cyst, removed by Mr. J. W. Thomson Walker, from the front of the sternum in a girl of five years, was shown to the meeting. Since infancy a small round swelling had been observed, which had increased to the size of a large horse chestnut. It was easily dissected out. On microscopic examination hair-follicles, sebaceous glands and sweat-glands were easily recognized.

A Specimen of Tuberculous Caries of the Upper Dorsal Spine, with an abscess pressing on the bifurcation of the trachea, was shown by Mr. Douglas Drew. The patient was a child, aged five years, who, while under treatment for spinal disease, developed some difficulty in breathing, which at times became rather urgent. One of these seizures proved fatal from asphyxia. The upper dorsal vertebræ were found to be extensively diseased, and there was a large thick-walled abscess pressing on the trachea and bronchi.

A Specimen of a Cystic Lung, removed from an infant five months old, was shown by Dr. George Carpenter. The lower lobe of the left lung was cystic, the largest cyst being the size of a small orange. It was probably of congenital origin, and akin to the cysts found in the kidneys and spleen. During life the prominent feature was dextrocardia.

Cases of Lymphangioma were recorded in a paper read by Mr. Albert Carless, which was discussed by Mr. Douglas Drew and Thomson Walker.

EDITORIAL

RELIEF IN NERVE PALSIES.

After many years of despondency and darkness it would seem that many of the intractable cases of chronic invalidism in children are giving way before scientific progress in therapy.

For many years orthopedic surgeons have labored with chronic bone conditions and the results, often brilliant, have come to be the expected thing in this branch of pediatric therapy.

Lagging behind, but yet as full of interest, have been the muscular and bony deformities resulting from nerve tissue lesions. The many little patients with Erb's palsy, with facial palsy following otitis, and anterior poliomyelitis, have been doomed to live out fragmentary and unhappy lives.

It is a signal of great promise that within the recent decade neurologists and surgeons have been working together to obviate these particularly chronic defects; and further, their efforts are commencing to be crowned with success.

Ballance and Stewart, Faure and Foret, Spiller and Frazier, Kennedy, Cushing, Clark and Taylor and others have now reported cases of obstinate and long-standing nerve palsies in which the patients have been cured by nerve anastomosis.

Kennedy first reported a successful cure of nerve anastomosis for a spasmodic tie. Frazier cured a case of facial palsy by grafting the distal stump of the facial nerve on the healthy stump of the spinal accessory, and more recently Clark and Taylor have done the same thing with the hypoglossal. In Erb's palsy promising results are looked for, and more recently Spiller has had some very encouraging results in anterior poliomyelitis.

We feel persuaded that in nerve anastomosis a fruitful field of therapeutics has been opened up and that it only needs refinement in technique to literally make the dead limbs walk.

BRONCHOPNEUMONIA IN CHILDREN.

The recent discussions on bronchopneumonia in children, held at the N. Y. Academy of Medicine, and which have been reported in brief in PEDIATRICS, bring into strong relief the prevailing belief that bronchopneumonia is an extremely serious disease, far outrivaling true lobar pneumonia in gravity in children.

Dr. Nicoll, in his paper on the Symptomatology and Differential Diagnosis (*Medical News,* April 30, 1904), shows that bronchopneumonia is essentially a disease of the poor and unfortunate. In dispensaries, tenements and asylums it is most frequent. The important feature is not the germ—it is the soil. The conditions which render children susceptible to the disease are insufficient fresh air and sunlight, improper food, or food not adapted to the individual needs; unsuitable clothing; health impaired by previous illness, and lack of attention to pathological conditions of the upper air in passages. The results are rachitis, anemia, chronic pharyngeal catarrh, and final bronchopneumonia.

Dr. Nicoll presents further a valuable series of data derived from the study of 167 cases. He finds that it is liable to occur at all times of the year. Males seem more liable to develop the disease. About 58 per cent. were below 1 year of age, 20 per cent. 1 to 2 years, 13 per cent. 2 to 3 years and 9 per cent. over 3 and under 5. The onset was usually very irregular. Occasionally it was primary, but more often secondary, to other nasopharyngeal affections. The symptoms given offer little not covered by the standard text-books. Cough, it may be of interest to note, was absent in some patients, and suppression of cough was noted in some of the fatal cases.

Dr. Bovaird, speaking of the Pathology of Bronchopneumonia, distinguishes three types. In all three the process is regularly bilateral and for the most part symmetrical. The posterior parts of the lungs usually show more consolidation than the anterior. The bacteriology is complicated. The pneumococcus is prevalent in 50 per cent. In other instances streptococci, staphylococci, Friedländer's bacillus, diphtheria bacillus, and the typhoid bacillus may be found. The majority of cases show mixed infections, the pneumococcus being found in the primary cases, the other forms in the secondary cases.

Dr. Northrup, in discussing the treatment, lays great stress on fresh air which should be cool and changing, about 65° F. Oxygen of the air is all-important, and a laboring lung should not have to make extra effort to get its normal supply. Plenty of water is indicated, cool and fresh. Quiet and rest. The sick room of the child should be kept free from friends and relatives. Free evacuation of the bowels by castor oil. Careful regulation of diet. An ice cap to the hair he believes foolish. The hair is a bad heat conductor. Heart stimulation is not always needed—hot foot-baths are often as good. High hot salines are also valuable.

If it is the object of the friends to kill the baby, the following formula will do it: "Crib in the far corner of the room with a canopy over it. Steam kettle; gas stove (leaky tubing). Room at 80° F. Many gas jets burning. Friends in room, also the pug-dog. Chest tightly enveloped in waistcoat poultice. If child's temperature is 105° F., make the poultice thick, hot and tight. Blanket the windows. Shut the doors. If these do not do it, give coal-tar antipyretics and wait."

ABSTRACTS

Reflex Disturbances Associated with Adherent Prepuce.—Robert M. Simon (*Brit. Med. Journal,* March 12, 1904) reports the following cases:—Malformation and unusual condition of the penis practically never come under the notice of a physician, and it is, therefore, not remarkable that one's attention can only rarely be directed to such conditions as having a possible and an exciting influence in causing widely differing and remote disturbance of functions in other organs. Within the last few years, however, I have seen three cases in which the symptoms were due to adherent prepuce or a narrowed urethral meatus. In not one of these cases was there any reason to associate the symptoms with any trouble about the penis, nor was such trouble suspected. It was only after every other possible cause had been considered, and the symptoms had been treated without the slightest benefit to the patient that a thorough examination revealed a condition of the penis which, if not the cause of the symptoms complained of, was, at any rate, so far from normal as to render local treatment desirable.

Case 1.—A boy, aged eighteen months, well made and growing rapidly, suddenly became unable to walk. He dragged one leg, and complained of pain in the hip. Any attempt to make him walk caused severe pain, and, at any rate, was resisted with screams. He was under the care of one of the best known practitioners of this city, who suspected, despite the absence of many signs, incipient hip mischief. One of our leading surgeons examined the child, and gave a positive opinion against the existence of hip disease but was not able to do or suggest anything which helped to restore the child's walking power or relieve the symptoms. When called in to see the child I thus had the advantage of the opinion of two doctors more familiar with the subject of hip disease than myself, and of their assurance that hip disease was not present, so *faute de mieux* I tried to find some cause of reflex irritation, and after irritation by worms had been considered and negatived, we examined the penis.

The prepuce was found to be long and adherent. The child was circumcized and recovery was immediate and complete.

Case 2.—A boy, aged fourteen, was sent to me from a neighboring town on account of obstinate and severe intestinal colic. No medicines had relieved him, and I advised that he should be treated as though colic had been due to lead poisoning. More thorough examination, after this plan had been tried and failed, revealed an adherent prepuce. This was treated, no medicines being given, with complete disappearance of all symptoms.

Case 3.—A boy, aged three, had been perfectly well during infancy, but when developing from an infant into a well-grown little boy, began to wake up at night screaming and complaining of pain in the abdomen. This occurred night after night with a regularity which resulted in great disturbance to the household and loss of sleep to the little boy, whose health began to suffer. I saw him several times and treated him unsuccessfully for night terrors and indigestion.

I found that advantage was taken of his being awake to get him to pass water, but though he went to sleep afterwards I failed to associate the fact with his symptoms. It was only after all efforts to help him had been futile that I examined the penis. The prepuce was found to be adherent and the meatus narrow. These conditions were treated surgically and immediate and permanent cessation of symptoms followed.

It is probable that in the third case the need to empty the bladder was the starting point of the symptoms, and that the call to micturate was associated with some erection of the penis, any turgescence of which would be rendered painful by the adhesion of the prepuce. The boy was not old enough to describe his condition accurately, or locate the pain with certainty, so that both by his parents and myself he was considered to be suffering from indigestion. This explanation will not apply to the second case, which, like the first, must have been due to some reflex disturbance of the nervous system.

In the first case, that of inability to move the leg, it would appear that there must have been inhibition of spinal nerves, due to the peripheral irritation of an adherent prepuce. It is, of course, a truism that we ought to examine our patients thoroughly, but these cases show how great is the necessity to do so when the symptoms complained of are anomalous, and inconsistent with those generally accepted causes which underlie similar disturbances of function.

Milk Epidemics and Bovine Mammitis.—A recent editorial in the *British Medical Journal*, March 12, 1904, says that Professor J. Wortley Axe, Consulting Veterinary Surgeon to the British Dairy Farmers' Association, has made to that Association a report upon the relation of udder disease in cows to the epidemic of sore throat which occurred in the districts of Woking and Horsell last autumn. The report of Dr. R. W. C. Pierce, Medical Officer of Health for Guildford and Woking, on this occurrence was published in the *British Medical Journal* of December 5, 1903. It will be remembered that the symptoms from which the patients in this epidemic suffered were severe sore throat, febrile and general constitutional disturbance, with enlargement of the glands of the neck, in some cases ending in suppuration. It was shown that four of the cows in a herd which supplied milk to the infected houses were suffering from mammitis, and the milk yielded from the infected udders was visibly altered to the naked eye; in fact, it was reported that the liquid yielded by two of the cows consisted for the most part of pus, such as would be obtained from an abscess. Professor Axe reports that the farmer assured him that this liquid was thrown into the hog tub, and did not form part of the milk supplied to the dealers. Professor Axe further points out that it would appear that the precautions taken were not completely effective, as the retailers of the milk had a month or two previous to, as well as shortly before, the epidemic called the attention of the farmer to the fact that the milk either did not keep or gave a slimy deposit. While admitting that the presence of pus or muco-pus and streptococci in milk is "filthy, disgusting and may prove hurtful to public health," he contends that there are not sufficient grounds for attributing to the products of the mammitis the effect of producing such an epidemic as that which occurred in and near Woking. He suggests that the infection was derived from the farmer, who had stated that he did not drink milk, but had been taken ill with sore throat and pains in the joints in the middle of September, though he did not consult his family doctor until September 20, very shortly before the epidemic broke out; other members of the family suffered from the disease shortly after this date. Professor Axe says that the evidence of the dairy farmer and his wife was sufficient to prove that opportunities were not wanting whereby the milkpans and other utensils used in the business could, and as it would appear did, become contaminated with infection from a human source. The farmer's wife and her daughter, who were waiting upon the sick farmer, washed the dairy appliances in the same sink as the plates and other articles used in the sick room. Professor Axe concludes that these circumstances point to at least possible infection of the milk from a human source. As against this view we have the facts given by Dr. Henry Kenwood in a report upon a recent epidemic of illness due to milk in Finchley. The symptoms were similar to those in the outbreak at Woking, but of a milder type. Dr. Kenwood was able to satisfy himself that the persons employed in the dairy from which the infected supply came had not been suffering from a bad sore throat at the period when the outbreak occurred; moreover, the precautions taken for safe storage and delivery of the milk were quite satisfactory, in fact, in many respects exceptional as to care and stringency. Bacteriological examination in these outbreaks has not, so far, yielded a positive result beyond showing the presence of certain streptococci, the pathogenic nature of which has not been established. Dr. Kenwood states that, as the result of a veterinary examination, the veterinary expert found two cows yielding milk which became curdled, and he concludes that the milk given by these two animals contained the material responsible for the outbreak. Dr. Kenwood concludes that the only way to prevent such occurrences is regular and frequent veterinary inspection; and, as already said, even Professor Axe admits that the presence of pus in milk is filthy and disgusting. We quite agree; and we trust that the circumstances of these two outbreaks may receive the attention of the president of the local Government Board, in whose promised Public Health bill provisions should be found for safeguarding the milk supply, and making the Dairy, Cowsheds and Milkshops Orders really effective means for preventing disease. We believe that great improvements would be effected if county councils were given power to compel rural sanitary authorities to adopt and enforce the model regulations issued by the Local Government Board. That a matter of such grave importance to the public health as the purity of the milk supply should be left in the very unsatisfactory state shown by the facts published in our columns in the series of articles on the milk supply and on many subsequent occasions is a slur upon those responsible for legislation.

Primary Acute Pyelitis in Infants.—Dr. Marcell Hartwig (*Berlin. klin. Woch.*, November 30, 1903, p. 1104) says that primary acute pyelitis in infants has only recently been described, probably owing to the difficulty of obtaining a specimen of urine for examination and the fact that the symptoms of the disease do not appear to be renal. The writer has seen three cases. The symptoms closely resemble those of typhoid fever. The child becomes feverish, and the pyrexia steadily increases until 106° is frequently attained. Antipyretics produce a temporary fall of temperature, which, however, rapidly rises again. Widal's test is negative and splenic enlargement doubtful. The lungs are normal and nothing can be found to account for the pyrexia. After this had persisted for a fortnight in the first, and a week in the second and third cases, the urine was examined. It was acid, turbid and contained numerous bacilli and pus corpuscles. In the first case the pyrexia continued six weeks, and a month later a secondary abscess appeared over the angle of the jaw. The child recovered after this was incised and drained, and has remained in good health for two years. In the second and third cases antipyretics and bromide of sodium were given to prevent convulsions. In the second urotropine was also given and recovery was complete in three weeks. In the third turpentine was given as well as urotropine, and the child recovered in four weeks. The first patient was a male, the remainder were females, and all were breast fed. The parents were healthy. The specimen of urine which was examined bacteriologically contained ten varieties of microbes, the bacillus coli communis predominating. Some hours had elapsed between micturition and examination. Until Rovsing demonstrated that micro-organisms when injected into the veins of the ear in rabbits sometimes attacked the renal pelvis, the occurrence of primary pyelitis was inexplicable. The few cases of pyelitis which have been found post mortem in infants have usually been secondary to diseases such as pyæmia or vulvitis. In these cases the method of entry of the organisms could not be discovered. There had been no preceding dyspepsia to suggest the intestine. The occurrence of an abscess at the angle of the jaw in the first case suggested that tonsillitis might have been overlooked. In all doubtful cases of continued fever in infants a microscopic examination of the urine is essential. Urotropine was given in doses of 0.06 to 0.1 gm. (about 1 to 1½ gr.) thrice daily, and turpentine in doses of 2 drops similarly. The temperature became normal before the pus and bacilli had disappeared from the urine.

Henoch's Purpura Simulating Intestinal Obstruction.—Harold Burrows (*Brit. Jour. of Children's Diseases,* January, p. 28) reports a case of a boy, aged eleven, who was sent to the hospital on July 6 with the diagnosis of intussusception. He had felt ill for about ten days. On the day of admission he was seized with violent abdominal pain, soon passed a formed motion with about a tablespoonful of blood, and was sick. The doctor said the vomit was fæcal. He was pale, and had an "abdominal" expression, and constantly moaned with pain, mainly in the epigastrium. The tongue was brown and the breath peculiarly offensive. The pulse was 110, of fair volume, and not of the abdominal type. The abdomen was tender all over, nearly motionless and rigid, especially in the lower part. There was no distension. Rectal examination revealed only tenderness in the recto-vesical fold of peritoneum. The patient had not vomited during the short time he had been in hospital, but there seemed no doubt that stercoraceous vomiting had occurred. The odor of the breath seemed conclusive. Intestinal obstruction was diagnosed in spite of the absence of abdominal distension. Peritonitis was also diagnosed, because there were abdominal rigidity and tenderness of the recto-vesical fold. The severe pain and the expression supported the diagnosis. It was thought that the character of the pulse and the cessation of the vomiting might be due to opium administered. The two most likely possibilities appeared to be intussusception and obstruction due to some inflammatory condition, perhaps in the region of the appendix. The latter appeared the more probable on account of the early appearance of signs of peritonitis. The patient was examined under chloroform. With moderate anesthesia the abdominal rigidity did not disappear. Laparotomy was performed. The appendix was found normal. So far as could be seen the greater part of the small intestine was pale and nearly empty. A portion of ileum, a few inches from the ileo-cæcal valve, was congested. There were petechial and irregular patches of congestion from which the blood could be expressed. Over the congested areas the peritoneum was sticky and had lost its gloss. The abdominal wound was sutured, and a carious molar was extracted. Pus escaped from the socket. Next morning he was free from pain. A careful search was then made for other petechiæ, and some were found on the backs of the elbows, on the buttocks and on each leg over the tendo Achillis and heel. The tongue was still very foul. The temperature was 99.6° and the pulse 110. The hemorrhages seen at the operation suggested general septic infection connected with the dental abscess; but the temperature during the following days was only slightly raised. Within a few days there was a general eruption of purpura, and for the first time the possibility of the case being one of Henoch's purpura was considered. Dr. Goodhart confirmed this diagnosis and suggested that a more precise history of the illness should be obtained. The mother stated that on June 26 she noticed that the boy walked lame. He explained this by saying that his legs ached and felt stiff. They were covered with bumps and red spots. She also found a rash on the elbows and buttocks. The boy said he felt quite well. Next day the rash faded. On the 30th a rash appeared all over the body, and he said he did not feel well. He complained of toothache. Had this history been obtained earlier the patient would probably have been spared a useless laparotomy.

The breath remained foul and the tongue coated during the patient's stay in hospital. Whenever tested the urine contained excess of phosphates and a trace of albumin. There were frequent eruptions of purpuric spots, sometimes confined to the elbows and buttocks, and at others distributed generally. No retinal hemorrhages were observed. On July 25, after eating chocolate, the patient had a sudden severe attack of abdominal pain, and passed about 1½ oz. of blood. He had the appearance of one suffering from a serious abdominal lesion. The pain was intense; 15 m. of tincture of opium administered per rectum gave some relief. Three days later there was a general eruption of purpura. Recovery followed. The surgical importance of Henoch's purpura is not mentioned in the text-books. Yet this is not the only case of the disease in which an unnecessary operation has been performed. In most recorded cases there has been a history of purpura for some days or weeks previous to the abdominal symptoms. Therefore, in a doubtful case, inquiry should always be made with regard to this point. The absence of abdominal distension would have led the writer to delay operating had there not been evidence of peritonitis. The latter symptom, in conjunction with the patient's age, induced him to advise immediate operation. A somewhat similar case of stercoraceous vomiting in Henoch's purpura has been reported. The lesion giving rise to abdominal symptoms is a hemorrhage into the wall of the gut. This might lead to a temporary blocking of the bowel, or might even set up reverse peristalsis. If the possibility of Henoch's purpura had been considered and the history more fully investigated, the patient would have been saved from an unnecessary laparotomy.

Intussusception and Henoch's Purpura.—G. A. Sutherland (*Brit. Jour. of Children's Diseases,* January, p. 23) says Henoch's purpura is a variety of purpura hemorrhagica which merits more attention than it receives. It commences suddenly without obvious cause and is characterized by recurrent attacks of hemorrhage into the skin, stomach, intestines and kidneys; by severe colicky pains, by vomiting and diarrhea, and sometimes by pains in the back, limbs and joints. It runs a somewhat prolonged course and usually terminates in recovery. The patient cries out with the pain, tosses about, and presses on the abdomen. Exhausting sickness follows, and the vomit frequently is blood-stained, or consists of pure blood. The tongue rapidly becomes coated and the breath offensive. At first constipation is marked, but in a few days diarrhea sets in; the motions are offensive and blood-stained, and soon pure blood is passed, perhaps in large quantity. The abdomen usually is retracted and may be tender over the colon, especially if tenesmus is marked, but as a rule physical examination shows nothing abnormal. Such an attack may last for a few hours or a few days, and then there is a gradual remission of symptoms until the next attack. The following two cases illustrate certain unusual conditions: *Case* 1—A boy, aged five, was admitted to hospital on October 10, 1903. Eight days previously he was seized with severe abdominal pain and vomiting. The pain was so severe that he screamed. The symptoms continued intermittently for four days and then passed off, but recurred two days later and were more persistent. The bowels acted irregularly until the day before admission, when the motions were at first blood-stained, and later only pure blood in large quantity was passed. The sickness had ceased, but the abdominal pain was constant. The temperature was 98.8° and the pulse 110. The boy looked ill and was suffering from almost constant attacks of colicky pain, during which he threw himself about, or sat up in bed with his knees drawn up, or lay face downward, pressing the abdomen on the bed. He referred the pain to the umbilical region. The abdomen was distended, especially in the upper half. It was so resistent that examination was impossible without an anesthetic. Nothing was found. On rectal examination the finger became blood-stained. Five mm. of laudanum were given for relief of the pain. On the following afternoon the abdomen was more distended, and palpation was impossible. The pain had been relieved temporarily by the [illegible], but had recurred. After consultation with Mr. Murray it was decided to operate, as the symptoms indicated abdominal obstruction, probably from intussusception. On opening the abdomen the sigmoid flexure and part of the descending colon were found enormously distended. The transverse and descending colon was rather collapsed. A part of the small intestine, about 5 inches long, was dark, probably from extravasated blood, and the walls were thickened. About ½ inch from this was a circular band of red color, evidently a more recent hemorrhage. Mr. Murray described the dark, thickened portion of bowel as feeling exactly like an intussusception which had been reduced, and had little doubt that reduction had taken place during the manipulation. During the night following the operation abdominal pain occurred at intervals, but it seemed less severe. The bowels acted thrice, the motions being loose and offensive. For the next five days there was occasional pain, seldom severe; the bowels acted regularly, the motions usually being offensive: there was sometimes blood in the motions, but only once of any amount; the abdomen was retracted. Although the temperature was normal the pulse continued rapid, 120 to 130, and was very weak, while the tongue was inflamed and coated. Then the condition changed. Blood and mucus were passed in large quantity, sometimes dark in color, sometimes bright. Soon the hemorrhage was continuous, the boy apparently losing all rectal control. He vomited occasionally but did not appear to suffer much pain. A few brownish, purpuric spots appeared over the extensor surfaces of the knees and elbows. Next day fresh spots appeared over the buttocks, heels, back of the neck, ears, and inside the nose. There were the usual relapses characterized by vomiting, purpura, malena, abdominal pain, and lethargy. During the attacks, the boy wasted rapidly; in the intervals he gained again rapidly. Albumin appeared in the urine, but without blood or casts. Recovery followed. Case 2.—A girl, aged 7, was admitted in February, 1893, suffering from Henoch's purpura. The illness suddenly commenced five weeks previously with abdominal pain, sickness, and hematemesis. In the hospital there were recurrent attacks of abdominal pain, hematemesis, melena, bleeding from the nose and gums, purpura, albuminuria, and hematuria. She recovered and was discharged in May. In August she was readmitted with a history of a recurrence of all the symptoms a month previously. The abdominal pain was more severe. Frequent small doses of morphia were required. The abdomen was soft and flaccid. There were attacks of hemorrhage fr[illegible] organs similar to those described. On September 6 tenesmus became marked and continued irregularly for some days. It was accompanied by the passage of blood in larger quantities than before, the amount once being 6 oz. Thirst and sickness were prominent symptoms. The motions were frequent, loose and offensive. On the evening of the 10th a general convulsive seizure occurred, and the temperature rose to 104°. The fit lasted for three hours and blood was passed by the bowel. She remained comatose for the next three days and died. At the moment of death stercoraceous vomiting took place. *Necropsy.*—The whole peritoneum was covered with pus and lymph, and some 5 oz. of pus were lying free in the cavity of the pelvis. The small intestine was distended, and the lower bowel was collapsed and empty, with the exception of the rectum, which contained fæces. There was an intussusception of the cæcum and part of the ileum into the colon for about 4 inches. The containing and the contained bowel formed an adherent mass and during reduction the bowel ruptured in several places. The whole of the intestine involved was much thickened, black, hemorrhagic and gangrenous. The rest of the colon was normal, save for a number of small, superficial, clean-cut ulcers. The suppurative peritonitis and a ruptured intussusception probably were produced as follows:—Hemorrhage into the wall of the colon near the cæcum lead to paralysis in the affected part, and to increased muscular contraction (with colic) in the adjoining part. The latter caused invagination into the paralysed portion —a condition marked clinically by severe tenesmus. The obstruction was not complete, as shown by a passage of fæces; but the circulation in the intestinal wall was interfered with to such an extent that gangrene of the bowel took place—a result marked by a convulsive seizure. In Case 1 an intussusception which did not exist was diagnosed, and in Case 2 an intussusception which was present was not diagnosed. Thus intussuception may occur in Henoch's purpura. Perhaps the most important symptom indicating its supervention is tenesmus, severe and more or less constant. When an attack of Henoch's purpura sets in with vomiting, abdominal pain and constipation, as in Case 1, the problem is more difficult. There was no trace of purpura, and there was marked abdominal distension, such as is not usual in the abdominal crises of Henoch's purpura. Such an onset, without purpura, and with abdominal distension, is unique. Looking back on the case, the writer thinks it would have been difficult to have diagnosed Henoch's purpura at once, but the proper course would have been to have waited a little, relieving the intestinal spasm by opiates. The condition of the bowel is important, as few have seen the visceral lesions in Henoch's purpura. The purpura may take the following forms:—(1) small petechiæ on the visceral peritoneum; (2) petechiæ on the mucous surface, which became necrotic, forming small ulcers (these may lead to intestinal hemorrhage); and (3) hemorrhage into the wall of the bowel, which becomes thickened and inactive, causing severe griping, and possibly intussusception.

The Accuracy of Percentage Modifications of Milk for Infants.—D. L. Epsall and Chas. A. Fife, Philadelphia (*New York Med. Journal,* January 16, 1904) draw the following conclusions from their work:—

1. Milk modifications, under the best of conditions, will often vary 0.2 per cent., occasionally 0.3 per cent., from the prescribed formulæ, with modification of medium strength. With low modifications, the error will be correspondingly less; with high modification, correspondingly somewhat greater.
2. Home modifications are, within the limits just mentioned, trustworthy, if they are made by a clear-headed and careful person, from creams of a chemical composition that is known to be reliable.
3. If the composition of the milk and cream is not known, or if one cannot be sure that the modifier is careful and clear-headed, home modifications are likely to vary greatly from the formulæ prescribed.
4. Laboratory modifications appear from our figures to be satisfactorily accurate, and unless the milks and cream, as well as the person doing the modifying at home, can be fully trusted, laboratory modifications, when available, are much more reliable than home modifications.

Levulose in Children.—Sanitary Councillor Dr. L. Fuerst, of Berlin, in an elaborate paper on the importance of levulose in the dietetics of childhood (*Zeitschrift f. diät. und physik. Therapie,* February 1, 1903), says that this pure carbohydrate of Schering has many advantages for pediatric use. It is peculiarly suited for dietetic purposes, and its value as a remedy for chemical disturbances of nutrition has not by any means been adequately appreciated. This is the more remarkable because its usefulness as a food for diabetics has been testified to by Ebstein, von Leyden, von Hebra, H. Strauss, Fr. Voit and other authorities. Ordinary cane sugar is very apt to cause dyspepsia or intestinal fermentation in nurslings, and in powdered form is very apt to be adulterated. Milk sugar is not sweet enough in small amounts, in large amounts it causes diarrhea; nor can its purity be relied upon. Levulose is a carbohydrate that has most important advantages as a sweetener of infants' food. Its molecular form and caloric value is similar to that of milk sugar, and the agreeable taste that it gives the milk renders it most suitable. Even when used for months at a time it never causes gastric or intestinal disturbance, and it is very rapidly assimilated. He gave Levulose in 17 dispensary cases, all belonging to the poorer class and with unfavorable surroundings. Three suffered from general scrofulosis (glands), without any signs of tuberculosis; three were probably tubercular and had chronic bronchitis and bronchiolitis afterinfluenza, measles and pertussis, and were greatly emaciated; two had anæmia, and one could not recover from a severe bronchopneumonia. In all of them, as in the children not suffering from a definite disease, the dietetic-hygienic conditions were as far as possible regulated; and in all of them several weeks of Levulose treatment caused visible improvement and increase in weight. The author divides the cases in which he used the remedy into three classes and analyzes its action in each of them. They are:—(1) Infants fed chiefly on cow's milk and suffering from malnutrition; (2) Children over two years old suffering from insufficient nutrition, and (3) Sick or convalescent children. Fuerst is not certain whether alimentary tuberculosis due to infection through the milk does occur; but there is always the possibility of bacterial invasion from the intestines. The extremely ready assimilation of Levulose, however, gives a means of combating infections of the mesenteric glands of this nature. In general in children predisposed to tuberculosis, Levulose, in combination with an appropriate diet, will do a great deal; and it will not be less efficient because it is a simple, non-artificial and natural dietetic agent. Levulose improves the subjective and objective condition of the patient by increasing carbonic acid production, promoting absorption and assimilation, and causing the deposition of fat in the tissues. It does everything that can be expected of a non-specific treatment. And the improved nutrition enhances the powers of resistance to noxious influences in the infantile organism.

BOOK REVIEWS

LEHRBUCH DER KINDERKRANKHEITEN auf Grund der 8 Auflage des Lehrbuches von PROF. A. VOGEL, ganz neu arbeitet von Ph. BIEDERT in Hagenau. Twelfth edition, enlarged and revised by Ph. Biedert and R. Fischl. Stuttgart, Press of Ferdinand Enke.

The first edition of this text-book was written by Vogel of Munich so long ago as 1860, when bacteria were scientific curiosities, when laboratory milk was unheard of, and when specialization was at its beginning. After forty-three years, therefore, this twelfth edition is as unlike the original as if it were quite a new work; it is, as we might expect, not Vogel's book, but a treatise by Biedert and Fischl on children's diseases as they are known today.

It is not a practice of medicine, a surgery or a work on orthopedics, but, all-inclusive, attempts to cover every ailment to which child-flesh is heir.

This is the old-time idea, but would not such a book be more authoritative were the pediatrist to relegate surgery and orthopedics to the specialists in those branches, and to confine himself to the medical or minor surgical aspects of his specialty? Certainly one has but little regard for a medical man's teaching on genu valgum, pes varus, or a dislocation of the hip; and hardly expects an authority in surgery to understand intimately pneumonia, measles or artificial feeding.

The most noteworthy difference of this book from those of American pediatrists is the omission of all but the most meagre statements regarding infant feeding. In America the "right food" is our first desideratum in treating a young child's maladies, but the author's ideas on this subject are somewhat vague as evidenced when they say "ordinarily an infant should be nursed not oftener than every two hours, and if it cries much, or has many stools, or vomits, the nursing is too frequent." They recommend that weaning be commenced at the seventh month, by each day replacing one or more nursings with tapioca, pea or bean soup, or yolk of egg; about the eighth or ninth month they allow cereals, zweiback, etc. Such is certainly not in accordance with American practice. They recognize that the essential difference between human and cow's milk lies in a chemical difference in their proteids, but never once mention lactalbumin or lactoglobulin.

It is, however, in dealing with the diseases of childhood other than digestive and nutritive that the book shows its value, for here we have presented the German point of view as based on the most recent scientific investigations. Biedert agrees that in the first year of life typhoid fever is rare, but then proceeds to report from his own experience a whole series of typhoid cases in children under six months, "the disease occurring even in children fed only at the breasts of healthy mothers, or wet nurses." He finds that epistaxis is very uncommon in children at the onset of typhoid fever, but bronchitis is almost invariable. For diarrhea his favorite drugs are bismuth subnitrate,tannalbin, tannigen, fortoin and ichthalbin with or without opium. We think our authors err in devoting so much space to ulcer of the stomach, appendicitis and other diseases which are more common in adult life, and properly belong to other medical and surgical works. But to the symptomatology of intussusception and some other essentially children's diseases, all too little space is devoted.

Taken altogether the book represents German practice and may, therefore, be highly suggestive, but to the general practitioner it is scarcely so helpful as some of our own American works, notably those of Holt and Rotch. The special changes in this edition are in the sections on septic infection, immunity, syphilis, rickets, diseases of the blood, diphtheria, typhoid fever and some of the diseases of the nervous system.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and Other Topics of Interest to Students and Practitioners. By Leading Members of the Medical Profession throughout the World. Edited by A. O. J. Kelly, A.M., M.D., Philadelphia, U.S.A., with the collaboration of Wm. Osler, M.D., John H. Musser, M.D., Jas. Stewart, M.D., J. B. Murphy, M.D., A. McPhedran, M.D., Thos. M. Rotch, M.D., John G. Clark, M.D., J. J. Walsh, M.D., J. W. Ballantyne, M.D., J. Harold, M.D., Edmund Randolt, M.D., Richard Kretz, M.D.; with regular correspondents in Montreal, London, Paris, Berlin, Vienna, Leipsic, Brussels and Carlsbad. Vols. II, III, and IV, Thirteenth Series, 1904. Philadelphia, J. B. Lippincott Co., 1904.

Volume II of this well known series, is divided into eight sections, devoted respectively to "The Summer Diarrheas of Children," "Disease of the Pancreas," "Treatment," "Medicine," "Surgery," "Pediatrics," "Obstetrics and Gynecology," and "Ophthalmology." The first of these is a most valuable symposium of six papers in which the causes and particularly the treatment, prophylactic and remedial, of cholera infantum, are thoroughly discussed. The lectures on the pancreas by Opie, Deaver and Muller are very instructive in the light they throw on the lesions of this mysterious organ. Kévi, in an interesting paper, describes favorable results he has seen attending the use of Trunecek's serum in arteriosclerosis and indicates the class of patients susceptible of improvement by this method. In an article on "Common Colds" Haig brings forward his well known ideas on the uric acid diathesis. The surgical lectures treat of hemorrhoids, abdominal diagnosis and the relief of traumatic epilepsy. Hamilton contributes an admirable essay on cirrhosis of the liver in children and the other chapters of the volume are of equal interest.

The third volume contains first a series of six papers presenting various aspects of gall stone disease, and four more on the treatment of pneumonia, gastric cancer, the carbonic acid treatment of rectal diseases and the serum treatment of typhoid fever; the latter by Chantemesse, describing the excellent results obtained in Paris by this method. The medical papers are devoted to the malarial infections, pneumonia, sudden death, leukemia and myocardial complications in rheumatism. Lucas-Championnière, in a paper on asepsis and antisepsis strongly recommends the latter and states his preference for carbolic acid as germicide.

The fourth volume contains twenty-eight papers mostly of unusual interest and included under the headings of "Treatment," "Medicine," "Surgery," "Gynecology and Obstetrics," "Neurology," "Orthopedics," "Ophthalmology," and "Pathology."

Tyson's paper on the treatment of gastric ulcer and Musser's on the treatment of pneumonia, are both very helpful, and angioneurotic edema is well discussed by Poynton in an essay on this unusual disease. The most interesting contribution of the volume is perhaps the description by Keen and Da Costa of their case of interilio-abdominal amputation for sarcoma of the ilium. Another essay deserving special notice is that of McFarland on immunity, in which the present state of our knowledge on this hazy subject is cleared of much of its vagueness.

SOCIAL DISEASES AND MARRIAGE. By PRINCE A. MORROW, A.M., M.D.; Lea Brothers and Co., New York and Philadelphia.

Regardless of its value to the profession,—and it can be reckoned only in the abstract—Dr. Morrow has given the world a lesson that should be learned from beginning to end. From this intensely interesting treatise of the social prophylaxis may be culled facts that clearly demonstrate the manifest destiny of the human race. The book is a connected series of clinics dealing exhaustively and in a lucid and convincing manner with the general subject.

In his opening paragraph Dr. Morrow says: "Man is the only animal who voluntarily limits his offspring, and who is subject to diseases distinctly inimical to the integrity of his reproductive function."

Space will not permit us to review the work at greater length, but we have room to say that here is a book wherein sociologist, practitioner and layman may view clearly a subject of inestimable importance to mankind, and the reader will probably accept most of the author's logical conclusions.

PEDIATRICS

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ORIGINAL ARTICLES

INTRASPINAL INJECTION OF LYSOL SOLUTION IN THE TREATMENT OF CEREBROSPINAL MENINGITIS, WITH A REPORT OF THREE CASES.*

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OF NEW YORK.

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The report of any method of treatment which is based upon three cases must necessarily be received with a certain amount of reserve; yet, in a disease with so high a mortality rate as cerebrospinal meningitis, the results in these three cases are so striking that I may be pardoned for publishing this method even after so limited an experience.

In this disease the determination of the prognosis in each individual case is exceedingly difficult, in spite of the fact that the mortality rate is so high. The gloominess of the prognosis is due to the poverty of our therapeutic resources. The perusal of the various monographs on the subject shows how very limited is the sphere of our therapeutic agents. How little advance has been made up to recent times is well shown in the article on this subject in Leyden and Goldscheider's classical treatise "Diseases of the Spinal Cord and Medulla."[1]

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*Read before the Section on General Medicine, New York Academy of Medicine, March 15, 1904. Courtesy of *Medical News.*

[1] Nothnagel's Specielle Pathologie und Therapie, 1897, 4. Band.

Councilman, Mallory and Wright, in their report on this disease published in 1898, even after the introduction of lumbar puncture, give an equally discouraging picture. Eichhorst's monograph, written in 1902,[2] the most recent publication on the subject is equally pessimistic.

So far as we have been able to learn from a review of the literature, methods of treatment have but little influence on the mortality, which for the epidemic form, is estimated from 20 to 75 per cent. While the sporadic form is not so fatal, yet the mortality of all the cases of cerebrospinal meningitis (including all varieties of bacteriological origin, the meningococcus being present in most cases), is often over 50 per cent. Among the recent methods of treatment may be mentioned prolonged hot baths at 104° F., from the use of which a number of cases of cure have been reported. The results of laminectomy and washing the spinal canal, as done by Osler and others have not been encouraging. The only real advance in therapeutics is the lumbar puncture, performed once or repeated a number of times during the course of the disease, but this alone has cured only a limited number of cases.

We are indebted to Seager for the publication of a new method of treatment, the results of which are most encouraging. His experience is based upon his observations in a series of cases of the epidemic form at Lisbon.[3]

This treatment consists of lumbar puncture and the withdrawal by aspiration of varying quantities of cerebrospinal fluid from the spinal canal, frequently amounting to 50 c.c. "Artificial serum is then injected with the same syringe, the needle being left in situ, and the surrounding parts are washed with serum; lastly, a quantity (from 9 to 12 c.c.) of a one per cent. solution of lysol is injected through the same instrument and the needle withdrawn. The temperature falls immediately, but rises again after one to three days, when the puncture and injections are repeated, and so on until only quite clear and limpid fluid is withdrawn after puncture, when the injection of lysol is stopped. Afterward a few punctures are made to see if the liquid continues clear." Seager calls attention to the painfulness of the treatment, which, however, my own experience in the three cases treated does not corroborate (see addendum).

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[2] Deutsche Klinik, II. Band, S. 321 et seq.

[3] Lancet, November 1, 1902. Seager does not state who first introduced this plan of treatment; but simply reports his observations at the Special Hospital at Lisbon.

Of the 31 cases in Lisbon which were treated with lysol, 13 died—5 from dilatation of the cerebral ventricles, 2 from pulmonary tuberculosis, 1 from edema of the glottis, 1 from purulent pneumonia and 4 from the disease without complications. The 18 that recovered were completely cured.

The early plan of treatment in this same epidemic was by hot bath and ice-bag to the head. Under this régime 60 per cent. died. Then simple lumbar puncture of the spinal canal was tried in 20 cases, in 3 of which the fluid was already purulent. Of these 20 patients 9 died, and of the 11 who recovered, 1 was deaf, 1 had persistent paralysis of the left arm and 4 had bed sores. The next 7 cases were treated with puncture, removal of the fluid and an injection of oxycyanide of mercury. The fluid was purulent in 5 of these cases, 4 of which proved fatal.

The number of cases treated by lysol could have been increased had Seager included 20 cases which were under treatment at the time of his report, but inasmuch as the duration of this disease is often long, he did not include those under treatment, although he states that the majority of them were in such good condition that their recovery seemed assured, hence the results of the treatment are even better than 57 per cent. of complete recoveries in the 31 cases noted above. The presence of the meningococcus was the only characteristic bacteriological finding in the cases.

Of the three cases which I report the first was a meningococcus infection and the second a virulent streptococcus. While it must remain an open question whether the meningococcus case would have recovered without this treatment, since the sporadic cases in adults not infrequently do so, yet the fact remains that the patient was losing ground steadily in spite of the various treatments, including lumbar punctures, which were employed. After the first injection he seemed to hold his own, while following the second his recovery was rapid and uneventful.

Of the second case I can speak with much more assurance, since, at the Mount Sinai Hospital, death has resulted in every case of cerebrospinal meningitis in which the streptococcus was found in the fluid obtained by lumbar puncture. The condition of the child at the time of the first lysol injection was so desperate that no one who saw the case expected him to survive the night, hence his complete recovery without any after-effects is all the more gratifying. It is to be noted that the washing out of the spinal canal with artificial serum was omitted in all of these patients. The injections were all made without anesthesia, except the first one in the child, which was done under slight chloroform narcosis. No pain was complained of and no unpleasant after-effects were noted.

At the present writing all of the patients are perfectly well. The details of the histories, for which I am indebted to Doctors Oppenheimer and Ziegel, of the House Staff, are as follows:

CASE I.—J. R., thirty-three years of age, Austrian, tailor, admitted to the Mount Sinai Hospital January 30, 1904. Family and previous history negative in all respects except an uncomplicated attack of measles as a child. Present illness began abruptly six weeks before admission with chill, headache, general bodily pains and fever. The headache, fever and prostration continued for about two weeks when the patient was able to be up. He then had another chill and the headache returned. Stiffness of the neck was complained of and he has since been in bed. He has been vomiting for the past four days, three or four times daily, not projectile. Slight cough and mucopurulent expectoration. Constipation has been a prominent symptom throughout. Urination is very painful and the total quantity is diminished. No herpes. Considerable loss of flesh and strength. Severe headache has prevented sleep, but the mental condition has been soporose.

The main points in the physical examination are as follows: Patient lying on the side with extremities and body flexed, but the head somewhat extended. Considerable rigidity of the neck. Tenderness on percussion of the skull. Some photophobia, pupils markedly contrasted, equal, react to light and accommodation; no strabismus. No facial paresis. Ears negative. Tongue is very dry. Marked tâche cérébrale. A few small, faint roseolæ on the abdomen. No general hyperesthesia. Abdomen retracted and tender on deep palpation. Tendon reflex somewhat diminished. Kernig's symptom somewhat marked but neither McEwen's nor Babinski's sign. Otherwise the physical examination was negative. Rectal temperature on admission 100.4° F.; pulse 46; respiration 18. Urine: Sp. gr., 1.020, total quantity 37 ounces. Faint trace of albumin, no sugar, 2.5 per cent. urea, a few hyaline casts and blood cells. Negative Diazo. White cells 23,000. Negative Widal.

The following day temperature rose to 101° F. in the evening. Pulse ranged between 54 and 66; respiration 18 to 20. Two counts of white cells showed 14,000 in one, 15,000 in the other.

February 1.—Since admission patient has continued to have severe headache with marked tenderness on percussion of the left side of the head. No vomiting since admission. Blood culture by Dr. Libman negative. Patient is mentally clear, but has a dull, apathetic expression. Rigidity of the neck marked. Still very much constipated, cathartics ineffectual. The left knee-jerk more active than the right.

February 2.—Temperature almost normal. Pulse ranged between 50 and 80; respiration 20 to 26. Lumbar puncture yielded 6 c.c. of somewhat turbid fluid which was obtained drop by drop (no pressure). Following lumbar puncture there was no increase of headache. Examination of the eyes by Dr. Gruening was absolutely negative.

February 3.—A few moist râles at the right apex. Two examinations of the sputum yielded no tubercle bacilli.

February 4.—Patient has improved somewhat; slight headache. Slept well. Rigidity of the neck the same. The tâche and the Kernig are still well marked.

February 6.—Recurrence of headache which is now more severe and general—worse on the left side. Tongue very dry and deviates to the left. No facial paresis. Pulse 66 to 68. Second lumbar puncture yielded 3 c.c. of turbid fluid the same as that obtained at the first tapping. Dr. Libman reports that meningococci are present in both specimens; polynuclear cells predominate. Percentage of albumin markedly increased; no reduction of Fehling's solution.

February 7.—The patient complained of severe headache immediately after lumbar puncture; but on the following day he complained much less of it.

February 10.—Yesterday afternoon after seeing visitors patient became stuporous and later almost comatose, with involuntary urination and defecation. Pulse 48 this morning. Takes nourishment with difficulty. Too weak to move in bed. Was given a hot bath at 104° F.

February 12.—Mental condition about the same—very apathetic. Feeding is difficult. Rigidity of the neck is undiminished. Tâche still present; knee-jerks absent. Kernig still present; knee-jerks absent. Kernig still present, but less marked. No Babinski or McEwen. Pupils equal, although yesterday the right was larger than the left. No paresis. Fundi negative. Hearing in both sides normal.

February 13.—General condition somewhat worse than on the preceding day and the patient lying on his side curled up in bed with rigid extended neck, almost comatose, in decidedly worse condition than at any time in spite of all treatment, which included prolonged hot baths at 104° F., iodides, ergot, etc. Having decided to use the lysol injection, a lumbar puncture was made and 12½ c.c. of slightly turbid fluid were withdrawn by means of aspirating syringe attached to canula; 9.5 c.c. of sterile one per cent. lysol solution were injected through the canula into the spinal canal, nine minutes being required for the injection. During and immediately after the injection patient was comfortable and no untoward symptoms followed the injection.

February 14.—Patient is just as apathetic as before, but does not complain of headache. Pupils are very unequal, the left being larger than the right, but they react to light and accommodation. The pulse is normal but the respiration is slow and somewhat irregular. No knee-jerk obtainable. Rigidity of the neck about the same. Tâche less marked; hypotonia of the muscles.

February 15.—He is decidedly better. Much less apathetic; slight headache only. Rigidity of the neck slightly diminished. Knee-jerks still absent; Kernig and tâche still present. Patient takes nourishment better; has no difficulty in swallowing. He looks brighter.

February 16.—Lumbar puncture attempted, no fluid obtained, but as the needle seemed to be in the spinal canal 10 c.c. of one per cent. lysol solution were slowly injected.

February 17.—Patient improving; no headache. Takes nourishment and sits up. Other signs same as noted. Knee-jerk still absent.

February 18.—Improvement continues. Out of bed. Can now touch chin to sternum.

February 21.—Walks about the ward. No symptoms complained of. No rigidity of the neck. Left pupil still larger than the right. Slight tâche appears very slowly. Knee-jerk obtainable on the left side, not on the right. Pulse 88 to 92; respiration 20. Temperature normal, as it has been practically since February 8.

February 23.—Patient apparently well. Knee-jerks returned. No rigidity of the neck. Pupils equal.

February 26.—Patient discharged cured.

Case II.—Walter A., born in United States, ten years of age, admitted February 23, 1904, to Mount Sinai Hospital, service of Dr. Sachs, to whose courtesy I am indebted for the privilege of reporting this case. The previous history of this patient will be found in Dr. Gruening's article in the Jacobi Festschrift (1900) entitled "A Case of Otitic Brain Abscess in a Boy Five Years of Age." This history in brief includes an attack of otitis, mastoiditis and brain abscess five years ago for which he was operated upon by Dr. Gruening. The pus from the brain abscess showed streptococci. The boy was discharged cured five weeks after the operation. During the past five years the patient has been absolutely well with the exception of an attack of measles two years ago. There has been no discharge from the ear. The boy was very bright mentally and there were evidently no sequelæ to his otitis brain abscess except loss of hearing on the right side.

Present Illness.—Four days before admission there was a sudden discharge of a large quantity of clear watery fluid from the right ear. Up to today there has been no pain, fever or constitutional disturbance. At 4 a.m. today there was again a profuse serous discharge from the right ear, the patient complaining of agonizing headache and bursting pain in the right ear. Temperature 104° F. He had a slight convulsion and vomited four or five times. Since this morning he has been stuporous with occasional attacks of restlessness. He is unable to urinate voluntarily.

Examination on Admission, February 23, 1904.—Patient semi-comatose, aroused with difficulty, unable to answer questions or recognize his surroundings. Lies fully flexed with retracted head and rigid neck. Photophobia; some injection of the conjunctivæ. Pupils are equal, moderately dilated and react normally. Left ear is negative. Right ear shows scar of previous operation in right mastoid region; there is tenderness. Profuse serous discharge from the right ear. Tongue moist and coated. Throat negative. Slight glandular enlargement in the anterior cervical and inguinal regions. No McEwen's sign; no tâche cerebrale. The respirations are very shallow, rapid (60) and irregular. Heart and lungs negative. Abdomen retracted, generally tympanitic. Liver and spleen negative. Knee-jerks diminished but present. Kernig's symptom present. No Babinski; no clonus. On admission temperature 105° F., pulse 104, respiration 60. White blood cells 22,400.

He was seen by Drs. Gruening and Sachs, the latter advising lumbar puncture, which was immediately performed by Dr. Lilienthal; 10 c.c. of very cloudy cerebrospinal fluid were withdrawn, the fluid being apparently under pressure. Dr. Libman reports as follows: On standing three-eighths inch purulent deposit. Cytology.—Nearly all the cells are polynuclear. Streptococci found in pure culture in spreads and culture. Albumin markedly increased; no sugar reaction. There was no apparent change in the patient's condition after puncture.

At this time, having been asked to see the case by Dr. R. Abrahams and Dr. Gruening, I advised the use of the lysol nijection. Four hours after the first lumbar puncture the second lumbar puncture was made, 9 c.c. of purulent fluid being withdrawn. Dr. Libman's report on this was the same as that on the first, with the exception that the fluid was more cloudy and contained more streptococci. Following the withdrawal of the fluid, 6 c.c. of sterile one per cent. lysol solution were slowly injected through the canula of the lumbar puncture needle.

The patient's condition at the time of the injection may best be inferred from the fact that none of us expected to see him alive on the following morning. During the night, the child, who had previously been stuporous, became very restless and had three general convulsions each lasting a few minutes. Digitalis and bromides were given, also nutritive enemata, since he was unable to take nourishment. On the following morning the temperature dropped to 101° F. He was able to urinate voluntarily.

February 24.—The patient is somewhat improved. Mental condition is soporose with intervals of restlessness. Pupils are equal and contracted. Knee-jerks not obtainable. Kernig's sign is present; no McEwen or Babinski. Tâche cérébrale now present. Patient must be catheterized every six hours. Urine, sp. gr. 1.010, trace of albumin; no sugar. Temperature 101° F. Pulse 108, fair quality. Respiration 52, shallow and irregular. Defecation involuntary. The discharge of serous fluid from the ear continues. Examination of the ear by Dr. Gruening shows the presence of a pedunculated mass covered with skin which almost completely occludes the external auditory canal and prevents inspection of the deeper parts. Four P.M. Lumbar puncture. Five c.c. of turbid fluid withdrawn. Dr. Libman's report the same as yesterday except that the streptococci grow much more slowly. A second lysol injection of 8 c.c. of a sterile one per cent. solution was given after the withdrawal of the fluid.

February 25.—Decided improvement in the patient's condition. Nourishment is being taken by mouth. The boy talks at times, though somewhat irrationally; is irritable on being disturbed. Meningeal signs are still present though less marked than yesterday. Temperature 101° to 102° F. Pulse 94, fair quality, slightly irregular. Respiration 30. Involuntary defecation still continues. Urine must still be withdrawn by catheter. Treatment: 2 grains of urotropin b.i.d., sodium bromide 3 grains q. 3 h., fl. ext. digitalis 1 m. t.i.d. Discharge from the ear continues free. Examination of the right fundus shows sharp outline of the disk with veins apparently congested.

February 26.—Improvement continues; patient is perfectly conscious and talks rationally. Complains of diplopia; no objective eye symptoms. No paresis of face or extremities. Knee-jerks have returned; Kernig's sign still present. No tâche

Takes considerable nourishment. Temperature 100.2° F.; pulse 100; respiration 30. Urination is now voluntary. Discharge from the ear as before.

February 27.—Recurrence of headache and stuporous mental condition. Lumbar puncture was repeated, 16 c.c. of clear fluid being obtained. No lysol was injected because the fluid was clear. Dr. Libman reports no bacteria in the smear; no growth in the culture. Culture of discharge from the ear shows numerous streptococci.

February 29.—Though the temperature still ranges from 101° to 103° F. the patient's general condition continues to prove. He is perfectly rational, takes plenty of nourishment, defecates and urinates voluntarily. The only meningeal symptoms which persist are moderate rigidity of the neck and Kernig's sign. Discharge from the ear continues. Culture from the urine shows no streptococci.

March 1.—Temperature 100° to 101° F. Pulse is now regular; respiration no longer rapid, shallow or irregular. Knee-jerks are obtained; Kernig's sign persists, also some rigidity of the neck.

March 2.—Discharge has ceased. Temperature, respiration and pulse normal. Patient looks and acts like a perfectly healthy boy.

March 6.—Out of bed. Perfectly well.

For the details of the third case I am indebted to Dr. Seff, of the House Staff of Mount Sinai Hospital. While on his vacation visit to his home in Northumberland, Pa., he was asked by Dr. C. Rutter to see a very severe case of cerebrospinal meningitis. The patient was a boy, six years old, who had had no illness except measles, some years ago. Family history non-tuberculous. An older sister had just recovered from an attack of cerebrospinal meningitis of four weeks' duration.

On March 3, 1904, he became restless and irritable. March 4.—At 4 p.m. had severe chill, followed by fever (103.2° F., mouth), pulse 114, respiration 36. Soon the child became stuporus, and rigidity gradually developed. Vomiting was frequent. Examination was negative, excepting the absence of tendon reflexes. During the night opisthotonos developed. This condition of marked irritability on arousing him, moderate fever, rapid and irregular respiration, pulse about 100, opisthotonos, etc., persisted, and this was the condition when Dr. Seff saw him on March 7. A distressing feature, in addition, was a very marked tympanitic distention of the abdomen. The entire body was covered with a fine papular, vesicular rash. Dr. Seff, knowing the good results in the two cases reported above, advised lumbar puncture and lysol injections. At 11 p.m. 5 c.c. purulent cerebrospinal fluid were withdrawn and 4 c.c. of a one per cent. sterile lysol solution were injected. Almost immediately there was a very abundant discharge of flatus with relief of the abdominal distention, although high enemata of various kinds had failed to relieve it. The night was uneventful; but on the following morning (March 8) the stupor was not so profound, the pulse was of better quality (104), respirations regular, fever 101° F.; the child seemed better in every way and the opisthotonos had disappeared.

March 9.—Child absolutely rational; reflexes have returned; some rigidity still present. Takes food readily.

March 12.—Child is practically well; is on soft diet. Unfortunately no cultures could be made, as Dr. Seff was unprepared for any such emergency.

In conclusion, I would state that I present the results of these three cases with all the reserve which must necessarily be associated with so limited an experience. Only a more extended trial will enable us to determine whether equally satisfactory results will be obtained in a larger number of cases. It is to be noted that these observations corroborate the results obtained at Lisbon; they are far better than any results which have followed the varied plans of treatment in the severer cases at Mount Sinai Hospital. Furthermore, the treatment is harmless, and involves as little risk as does lumbar puncture.

ADDENDUM.—Since the above was read on March 15, 1904, through the courtesy of Dr. B. Oppenheimer, House Surgeon at Mt. Sinai Hospital, I have received a copy of the original Portuguese monograph by Carlos France (*Meningite cerebro-espinital epidemica,* Lisbon, 1903). This essay, which is a very elaborate report on 103 cases of the disease observed in Lisbon, was unfortunately received too late to permit any extended reference while correcting proof sheets, but will be discussed elsewhere. Suffice it to say that as the result of his experience with the very fatal epidemic at Lisbon, França is very hopeful as to the results of the lysol treatment. He is emphatic in asserting that in many cases lumbar puncture alone will not cure severe cases.

The washing of the canal with artificial serum (normal saline solution) was used only in a few cases where the cerebrospinal fluid was very tenacious. This procedure is improperly described by Seager. This method consists in inserting a second canula between the twelfth dorsal and first lumbar vertebræ and injecting the artificial serum with a syringe through the upper canula and allowing it to escape through the lower; this being done until the fluid contains only a few flocculi.

The quantity of lysol solution injected is 3 to 9 c.c. for children and 12 to 15 c.c. for adults. The injections are made daily till the fluid is clear. If there is much hyperesthesia, or if the patient is very rigid, a short chloroform narcosis is advisable.

My subsequent experiences with the lysol treatment will be detailed later. Suffice it to say here that the results thus far obtained more than justify its employment in the severer cases.

THE CLINICAL FEATURES OF CEREBROSPINAL MENINGITIS, OR CEREBROSPINAL FEVER OF THE EPIDEMIC TYPE

By Henry Koplik, M.D.[1]

OF NEW YORK.

During the past few years additional interest has been given to the study of cerebrospinal meningitis of the epidemic form, due mainly to the investigations, on this side of the Atlantic, of Councilman and his pupils, Osler and others. A severe epidemic of this disease in Boston (somewhat over a hundred cases) has given Councilman an opportunity to study thoroughly the disease from an epidemiological as well as from a pathological standpoint. Osler has been able to study a number of cases occurring in an outbreak in Baltimore.

During the past five years there have been yearly outbreaks of this disease in New York, culminating in an extensive epidemic in the spring of this year. I have thus been able to study quite a number, some 37 cases, of the disease at the bedside, and to analyze carefully its clinical features. In this study I have utilized 77 cases of meningitis occurring in my service in the Mount Sinai Hospital, New York. These 77 cases were divided into the following groups: 37 cases of cerebrospinal meningitis of the epidemic type—21 of which were substantiated by culture and cover-glass spread to be due to the *Meningococcus intracellularis.* Of the remaining cases of the epidemic form, some were not substantiated by lumbar puncture being self-evident; others were so-called dry taps; 35 cases were of the tuberculous form of meningitis, as substantiated absolutely either by post or guinea-pig experiment, or by discovery of tubercle bacilli in the lumbar puncture fluids. One case was a so-called staphylococcus meningitis; one case, primary pneumococcus meningitis; one case streptococcus meningitis. In two cases, so-called pseudo influenza bacilli were found.

In the above statistics I have not utilized 15 cases of cerebrospinal meningitis which belong to the epidemics of the present year. Of these 15 cases, 5 died; of the remaining 10, 5 are still in my ward convalescing. Some of these cases were so classical and self-evident, or the symptoms improved so steadily that they were not subjected to lumbar puncture. The ultimate fate of the remaining cases cannot be stated as yet.

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[1] Read before the Association of American Physicians, Washington, D. C., May 10, 1904. Courtesy of *Medical News.*

Age.—The ages of the patients affected with epidemic cerebrospinal meningitis confirm the assertion that this affection is a disease of young people. Sixty per cent. of the cases were under two years of age; the youngest was four months of age; 77 per cent. of the cases were under four years of age, the oldest child being fourteen years. The average age was two years. In tuberculous meningitis, however, the average age was somewhat higher, only 41 per cent. of the cases being under four years of age, the average age being four years and four months.

Classification.—In looking over the literature on the subject of meningitis, the most lucid classification is given by Osler. He divides the classification into primary and secondary forms, which will be accepted by all. The primary forms include cerebrospinal fever, both of the sporadic and the epidemic types, and as a separate disease the pneumococcus meningitis. In the secondary forms he includes the tuberculous, the pneumococcus meningitis; the latter being secondary to pneumonia endocarditis disease or injury of the cranial bones. Third, there are the pyogenic forms, due to staphylococcus, the streptococcus, also secondary either to disease of the cranium or local infections. Fourth, are met the forms secondary to typhoid fever, influenza, diphtheria, gonorrhea, anthrax actinomycosis. Fifth, Osler would include in a separate rubric the so-called serous meningitis, which I may say is today being recognized as a secondary form of the disease, due possibly to infection by streptococci or pyogenic organisms. This classification, it will be seen, recognizes both the sporadic and the epidemic forms of cerebrospinal fever as being the same disease and due to the same essential cause.

My own cases are of the primary form of cerebrospinal fever of the epidemic type, including at least one form which may occur sporadically, the so-called posterior basic meningitis of Still.

Bacteriology.—The bacteriological features of my cases were worked out in the laboratory of the Mount Sinai Hospital, under the supervision of the pathological staff. Referring to a report of this work, by E. Libman, published in the Mount Sinai Hospital Reports of this year, it will be seen that all the cases were examined culturally. Reliance was not placed on cover-glass stain alone. All the cultures corresponded to those described by Weichselbaum. None of them, however, showed Gram positive diplococci. There was a variation in the growth on media not containing serum; but when this growth was obtained on such media, it was never profuse.

The conclusion is that there is one type of the *Diplococcus meningitidis* in the New York cases of cerebrospinal meningitis. This type corresponds to that found by Councilman and Wright in Boston; and Osler and Hirsch in Baltimore, and Herrick and others in Chicago. Both the nasal discharges and the conjunctival secretions were studied and in one of my cases the presence of the meningococcus was proven to be present culturally in the conjunctival inflammatory discharge. In this case there was a distinct history of conjunctivitis preceding the attack of meningitis, and the diplococcus was also established in the cerebrospinal fluid. We have never proven the presence of the meningococcus in the secretions and discharges of the nose. We have found, however, the *Micrococcus catarrhalis,* an organism which closely resembles meningococcus, whose cultural characteristics we will not enter into, but refer the reader to the extensive investigations of this organism by Dr. Celler, my former assistant, and published in the Mount Sinai Hospital Reports of this year.

Clinical Types.—The clinical picture presented by children suffering with cerebrospinal meningitis of the epidemic type is quite characteristic, not only in its onset but in the general course of the disease. I have been able to differentiate certain distinct types in the cases occurring in my hospital service and consulting practice. Previous to the present epidemic in New York, the malignant cases during the past four years have not been as common as they were during the present year. I have recently seen a number of cases presenting the malignant form in which children in previous good health are attacked with the disease, and die within twent-four or thirty-six hours.

The following case, one of the first of this year's epidemic, is quite a characteristic example of this type of the disease: An infant twelve months old, nursed at the breast, perfectly formed, a large, healthy, bright child, never previously affected by any illness; nursing and bowels normal. On the morning previous to the day when I saw the case with the family physician, the child appeared sleepy and heavy and refused the breast. It vomited, but was not feverish. That evening the physician was called in and found the infant quite drowsy and listless, with a temperature of 103° F., pulse 110 and very weak. There was no peculiarity about the eyes, no stiffness of the muscles of the neck or body. At 3 and 5 a. m., on the following day the child awoke crying and the mother discovered some red spots on the cheeks. The face was slightly swollen, the eyes staring, and the child was apparently blind. By 8 a.m., the entire face, hands and body were covered with blotches which turned bluish; the tissues of the extremities seemed to be hard and swollen; the buttocks and body looked as if the child had been beaten, ecchymosis being quite extended over the body and extremities when I saw the child. At this time the temperature was 101° F. and the pulse very weak, not to be felt at the wrist; the lips were blue; the reflexes abolished. When I saw the child a few hours later, it had no rigidity of the muscles of the neck; there was no Kernig symptom; the pupils were uneven and did not react; there was a slight conjunctivitis; and examination of the lungs, abdomen and ears gave a negative result. The breathing was irregular and catchy, the pulse very rapid and scarcely to be felt at the wrist. The diagnosis of cerebrospinal meningitis was confirmed by a lumbar puncture, made post-mortem, a cloudy fluid, milky in color, being drawn off, and the intracellular diplococcus of Weichselbaum being found in the fluid, both by stain and cutlure.

Since seeing this case, I have seen at least three others, each presenting similar features. In two of these rapidly fatal malignant cases the hemorrhages thus mentioned were preceded by an erythematous rash.

Another type of cerebrospinal meningitis is more commonly met with in which a child in apparent health is suddenly taken with dizziness or vertigo, vomiting follows, accompanied by severe headache, and then the child passes through the different phases of the disease which are well known and described in books on the subject.

A more puzzling type of cerebrospinal meningitis in infants and young children is that in which a child in apparent health is suddenly found to have a temperature, is restless, refuses the breast, vomits once or twice, and then for weeks will run an intermittent type of temperature, as high as 104° or 105° F., falling to the normal or subnormal daily. In the intervals of freedom from temperature the children or infants will play, and then when the temperature rises they may complain of slight headache, become drowsy, irritable and refuse nourishment. In these cases the typical signs of meningitis are not always present. The delirium may not be constant or may not extend over the twenty-four hours. The rigidity at the back of the neck may not be very marked, especially in young infants. In these cases also, the children may not have a marked Kernig symptom, especially if below two years of age. The most characteristic feature about these cases it seems, is the prolonged period of temperature of an intermittent type closely resembling malaria. In fact, the attending physician in many of these cases has examined the blood for the malarial plasmodium; or attention has been drawn by the intermittent type of the temperature to the ears in the hope that some focus of suppuration would be found. In other words, these infants and children may continue over a period of weeks with this peculiar temperature, and the outset of the disease has not been marked by convulsions or any of the classical symptoms of meningitis; and still a lumbar puncture in these cases will reveal the presence of the intracellular meningococcus in the fluid thus obtained.

In young infants, the type of the disease most commonly met with is that in which the onset is sudden, marked with general convulsions, high fever, vomiting at the outset, the high fever of the intermittent or remittent type, continuing over weeks. After the fever has lasted for some days or weeks, the mother will notice the rigidity of the head, the irritability of the child and the marked emaciation.

The Mode of Onset.—In all the cases that I have had opportunity to study in hospital service, in which the diagnosis was confirmed, the main characteristic of the onset of the disease was that it was abrupt. Observation has shown that children in apparent health would suddenly be attacked by the symptoms just detailed. In only a small percentage of cases has there been a doubtful history of the sudden onset. In this respect, the disease differs markedly from the meningitis of the tuberculous type, which is of slow onset, and in only a small percentage of cases is such a history doubtful.

Neck Rigidity.—Great stress has been laid by some authors on the presence or absence of neck rigidity. As has been hinted, there are some cases in which rigidity is not present at all times; but if these cases are observed for any length of time, our experience shows that slight or marked rigidity is present at one time or another in all cases of cerebrospinal meningitis. Opisthotonos is present in about 70 per cent. of the cases. In the posterior basic forms, of which we will speak later, the rigidity and opisthotonos is so marked that the child will assume the position seen in tetanus, being perfectly rigid, curved backward, the forearms extended, the fingers clenched in the palms; these are cases which only form a small percentage of the total number seen in an epidemic, and they affect mostly younger infants and children. According to Osler, neck rigidity or opisthotonos was not present in the adult form of primary pneumococcus meningitis. Rigidity was present in my own case of primary pneumococcus meningitis confirmed by autopsy. In our case, not only was rigidity present but also opisthotonos.

Reflexes.—In a majority of cases of epidemic cerebrospinal meningitis, the skin and tendon reflexes were present in the early stages of the disease, but were apt to disappear in the rapidly fatal cases, or in moribund cases.

The Babinski Reflex.—Babinski, a French neurologist, described the extension of the great toe on irritation of the plantar surface of the foot as a characteristic sign of disease of the pyramidal tracts or the lateral columns of the cord, and we have studied this sign in the forms of meningitis coming under our notice. We have found that in meningitis of the epidemic cerebrospinal type it was present in 4 of the 17 cases studied. This is in marked contrast to what is found in tuberculous meningitis. in which this reflex was absent in only 6 cases of the 26 in which it was sought. In other words, it was present in 77 per cent. of the cases of tuberculous forms of meningitis, and I regard the presence of this reflex as a valuable addition to the clinical picture of tuberculous meningitis as distinguished from cerebrospinal meningitis of the epidemic type. I can only explain its constancy in tuberculous meningitis by the fact that in these cases there is possibly an invasion, either directly or indirectly, of the pyramidal tracts or the lateral columns of the cord by the disease. The sign is of very little value, however, in children and infants below two years of age, for it may at times be seen in perfectly normal infants, or in those suffering from various affections. This seems also to be the conclusion reached by Morse, of Boston, who contends that the Babinski sign is quite inconstant in its manifestations in infants and children below two years of age.

The Kernig Symptom.—Much has been written about this very interesting symptom, the contraction of the flexor muscles of the lower extremities, as seen in cases of meningitis. I have found that the Kernig symptom is of very little utility in infants and children below two years of age. Of course, in infants, especially under one year, there is a normal tendency toward myotonia. Even superficial observation will show that normal infants are apt to lie with their lower extremities flexed, assuming very much the position of the fetus in utero. In children below two years of age suffering from meningitis, the irritability is so great that it is impossible to come to any conclusion as to the presence or absence of the Kernig symptom. In all the cases of cerebrospinal meningitis of the epidemic type above two years of age, therefore, the Kernig symptom was present. In cases of tuberculous meningitis, its presence was not so constant, being absent in 8 cases of 26 in which it was sought. I do not lay too great stress upon the presence of the Kernig as a pathognomonic sign of meningitis. It may be present in cases of which we are accustomed to say that there are cerebral symptoms without meningitis as in typhoid fever or pneumonia.

Hyperesthesia and Mental Irritability.—In the majority of cases of epidemic cerebrospinal meningitis, after the usual symptoms have set in and the disease is well inaugurated, the children, and even infants, are irritable, refuse to be comforted, start at the least sound in the room, lie mostly on the side, the arms and lower extremities flexed, the body taking the crouching position. Any attempt to disturb the patients is met with resistance. In the present epidemic, although many cases have been exceedingly mild, hyperesthesia, both of the surface, and irritability of the mind was very marked in all cases. In past epidemics of 21 cases hyperesthesia of the surface was quite marked in fully 62 per cent. of the cases.

In marked contrast to the above is the absence in the tuberculous form of the disease of any reaction or hyperesthesia of the surface. The child lies in a stuporous condition, does not notice its surroundings; whereas in the epidemic cerebrospinal meningitis, when not comatose, the children are alive to their surroundings, or are irritated by some things passing on around them. In the tuberculous forms of meningitis, hyperesthesia was present in only 3 of 34 cases. In other words, it was absent in 90 per cent. of the cases.

The MacEwen Sign.—MacEwen has pointed out that in children in various forms of meningitis we obtain on percussion a hollow note over the anterior horn of the ventricle. If the head is so held that the anterior frontal or parietal bone may be percussed over the situation of the anterior horn of the ventricle, this note will be produced. That is, if the patient sits upright and the head is inclined to one side, percussion of the inferior frontal of parietal bone will give a tympanitic note.

I have found that in 17 cases of tuberculous meningitis in which this note was sought, that it was present in 11, and it has seemed to me to be exceedingly valuable in making up the clinical picture of the tuberculous forms of meningitis. MacEwen thinks that the note is caused by the presence of fluid, so-called hydrocephalus, in the ventricle. In meningitis of the epidemic cerebrospinal type, however, this note is not obtained in the majority of cases. In 13 studied with this object in view, it was present in only two, showing the difference in this respect between the two forms of meningitis. In other words, if MacEwen is correct, there is very little distention of the ventricle with fluid in the first stages of the disease. In the chronic cases, however, with an increase of fluid in the ventricles, and these are the cases in which the note was obtained. I have found quite a marked MacEwen present.

Facial Pareses.—As is well known, facial paresis is quite a constant feature of the tuberculous forms of meningitis, and in 35 absolutely substantiated cases of tuberculous meningitis it was found in 19 early in the disease, and it appeared toward the close in most of the cases. In epidemic spinal meningitis, however, facial paralysis occurs only in the severest types of the disease where the intracranial pressure to one side or the other, especially at the base, is quite great, and in 13 cases in which it was looked for, facial paralysis, marked or slight, was present in only 2 cases.

Temperature.—One of the prevailing types of fever in children in the cases we have observed was that of the intermittent type, in which the temperature would be quite high at some time of the day, and normal or subnormal at another. The range of temperature would sometimes be very marked, four, five, six or eight degrees. In one case which I have under observation of the basic of Still, the temperature reached fully 106° F. to 106.5° F., falling to normal or subnormal at some time during the day. The temperature curve in epidemic cerebrospinal meningitis cannot be said to be characteristic, and at times will exhibit the widest irregularities.

The Skin.—In most of my cases I have not been able to find the prevalence of the rashes described by most authors. This is due, possibly, to the fact that in the epidemics I have observed skin rashes and eruptions were not common. On the other hand, herpes, referring especially to herpes of the lip, is also not very common and was present in only two of 20 cases. In the adult, however, Osler has found petechiæ erethematous rash, or herpes, in 13 of his 21 cases. In the epidemic of this spring I have observed a number of cases in which a roseola, closely resembling that seen in typhoid fever, was present. Lately I have seen a number of cases with a profuse petechial rash at the outset of the disease.

Eyes.—Contrary to what is the generally accepted opinion, we have found that expert examination of the fundus revealed no changes in the optic papilla in the majority of our cases of cerebrospinal meningitis, although in some there was dilatation of the veins, or congestion without neuritis. In only one case was there descending neuritis. In a group of 26 cases of meningitis of the tuberculous variety, examined by our expert, Dr. Gruening, some change was found in fully 77 per cent. of the cases. This change consisted either of an optic neuritis or papillitis, or the presence of tubercles in the choroid. In this group of 20 substantiated cases of tuberculous meningitis, 7 showed tubercles in the choroid. It would seem, therefore, that the condition of the fundus, aside from the positive discovery of choroid tubercle, gave us important presumptive evidence of the nature of the meningitis.

The Blood.—Every case of meningitis coming under our observation, including those of the cerebrospinal epidemic type, has been examined with reference to the leucocytosis present. The leucocyte count in all of our cases was made at intervals of three days in the course of the disease. In all of the cases there was leucocytosis to some extent. The leucocytosis was of the polynuclear type, the leucocytes ranging from 20,000 to 55,000, exceeding 25,000 to the cubic millimeter in fully 55 per cent. of the cases. The lowest leucocyte count in any case was 11,100 to 12,000 to the cubic millimeter.

This corresponds very closely to what was found by Osler to be true of the adult cases. In the tuberculous forms of meningitis in infants and children, we have not always found a so-called leucopenia. On the contrary, in fully 40 per cent. of the cases there was a leucocyte count of 20,000 to 25,000 to the cubic millimeter, and under 20,000 in 6 per cent. of the cases. In no case, however, did the leucocyte count exceed 24,000, except in one case of tuberculous meningitis, in which we obtained a leucocyte count of 32,000. The leucocyte count which has just been mentioned (with the exception of the one last referred to) having been made in 26 substantiated cases of the disease, would seem to be an important feature, if we compare it to what is true of the adult. In Osler's cases of tuberculous meningitis, leucocytosis was absent in only three cases; his highest count (24,333) corresponds so closely to what we have found true of our own cases in infants and children, that we are apt to be led to the conclusion that a higher leucocyte count in tuberculous meningitis is exceptional, and, if higher, would speak more for a meningitis other than tuberculous in any given case.

I have studied the leucocyte counts on both the cured and fatal cases with a view to determining whether any conclusion as to prognosis could be drawn from the results of a leucocyte count. In six cases, which recovered, we had the following results:

Case I.—Six years of age; observed from the fourth to the eighteenth day of the disease; leucocytes, 16,800 to 24,000. Puncture fluid clear.

Case II.—Twenty months of age; observed from the fifth to the fortieth day; leucocytes, 15,000 to 45,000, the latter toward the twenty-first day of the disease. Puncture fluid clear.

Case III.—Four and one-half years of age; observed from the fifteenth to the eighty-fifth day of the disease; leucocytes, 15,000 at the outset, 34,000 at the midperiod, 21,000 in the convalescence. Puncture fluid clear.

Case IV.—Five months of age; leucocytes, 20,000 to 22,000. Puncture fluid clear.

Case V.—One year of age; observed from the fifth to the fiftieth day; leucocytes, 14,000 to 28,000, the latter in the midperiod of the disease; 15,000 toward convalescence. Puncture fluid clear.

Case VI.—Two years of age, admitted on the fourth day of the disease with a leucocyte count of 40,000. Puncture fluid clear.

Taking a like number of fatal cases, we had the following counts:

Case I.—Four months of age; observed from the twelfth to thirty-seventh day of the disease; leucocyte count from 17,000 to 23,200, the low count at the close of the disease. Puncture fluid thick and turbid.

Case II.—Four months of age; observed from the twelfth to the twenty-ninth day of the disease; leucocyte count from 32,600 to 34,000. Puncture fluid cloudy.

Case III.—Six years of age; observed from the fifth to the fourteenth day of the disease; leucocyte count early of 30,000. Puncture fluid purulent.

Case IV.—Three years of age; observed from the ninth to the eighteenth day; leucocyte count ranging from 34,000 to 55,000. Puncture fluid cloudy.

Case V.—Ten months of age; observed over six weeks; leucocyte count from 10,600 to 26,0000, the latter toward the close. Puncture fluid turbid.

Case VI.—Six months of age; observed from the twelfth to the forty-seventh day of the disease; leucocytes, 28,000 to 17,600 early in the disease, and 9,800 to 18,200 later on, the former at the close of the disease.

It may be stated that in the so-called basic cases in infants and young children the leucocyte count early in the disease may range from 32,000 to 34,000, but toward the close, when the temperature rarely rises above the normal, the leucocyte count may fall as low as 9,800 to 10,600. In this respect the leucocyte count resembles what is found in cases of tuberculous meningitis; and these cases, on account of this, have been mistaken by some for tuberculous meningitis. The leucocyte count in the fatal cases in which the fluid obtained by lumbar puncture is quite turbid, with a sediment resembling pus, is apt to be high, mounting to 35,000 to 55,000. On the other hand, fatal cases with a thick turbid fluid on puncture may give a count not exceeding 23,200.

Cases which have recovered showed a leucocyte count of 14,000 to 28,000 during the course of the disease; the leucocyte may have mounted as high as 45,000, as in one case on the twenty-first day of the disease.

It cannot, therefore, be said that a prognosis as to the recovery or fatal issue can be made from the leucocyte count alone without taking into account the duration of the disease as evinced by the characters of the lesion as revealed by clinical methods of precision.

Characteristics of the Cerebrospinal Fluid Obtained by Lumbar Puncture.—So much has been said of the physical characteristics of the fluid obtained by lumbar puncture in cases of meningitis, either of the epidemic cerebrospinal, the tuberculous or the suppurative forms, that the writer scarcely deems it proper to repeat what has been said upon this subject. The cytology of the fluids obtained by lumbar puncture in cases of cerebrospinal meningitis is of particular interest as regards the possibility of making a diagnosis from the elements found in the fluid alone, apart from the bacteriology. Of 13 cases studied with reference to the cytology, 9 showed a preponderance of polynuclear leucocytes, and 4 showed mononuclear cells as prevailing elements. It would seem, therefore, that in the majority of cases of cerebrospinal meningitis of the epidemic type, the lumbar fluid presented a polynuclear leucocytic picture. In 15 cases of tuberculous meningitis, studied with a view to noting the character of the cell elements, 14 showed a prevalence of the mononuclear cells, and one case an equal number of mononuclear and polynuclear cells. In the above studies all the fluids were subjected to careful centrifuge.

In studying the cytology of the fluid obtained by lumbar puncture in this disease, much depends upon the method employed. If a drop of fluid is collected as it flows from the canula after it is introduced into the spinal space, a much more uniform picture is obtained than from fluid which has been subjected to centrifuge, as far as the cytology is concerned. This is contrary to accepted procedure. It would seem, therefore, that in tuberculous meningitis there is a prevalence of mononuclear cells, and this is so constant that it would seem to us to be characteristic, and verifies what is known from publications on this subject. It will be seen, however, that there are cases of cerebrospinal meningitis of the epidemic type, three of which we have noted, in which there is a cytological picture closely resembling that seen in tuberculous cases. In chronic cases, instead of a predominance of polynuclear cells in the sediment of the fluid obtained by lumbar puncture, the mononuclear picture is apt to present itself, closely resembling what is seen in the tuberculous cases. This is especially true of the chronic cases of cerebrospinal meningitis of the basic type described by Still. Bendix explains this variation from what might be called the normal picture in cerebrospinal meningitis by the fact, proven by Ribbert, that in chronic inflammations lymphocytes abound in the transudates, whereas in acute inflammations leucocytes abound.

It seems to us that the physical characteristics of the fluid obtained by lumbar puncture aid us but little in coming to a conclusion as to the form of meningitis present. In cerebrospinal meningitis of the epidemic type we have obtained fluid which has been quite clear, with scarcely any sediment, cloudy varying to the purulent fluid; whereas in the tuberculous forms of meningitis, the fluid was clear in 72 per cent. of our cases, but was quite cloudy in others, and more or less cloudy in the remaining number of cases. In all the epidemic cerebrospinal cases which we consider as substantiated either by the clinical picture or the results of lumbar puncture, the *Diplococcus meningitis* was found at one time or another in the puncture fluid. In one case it was found in two successive punctures, and in a third puncture it was absent and failed to give any culture when spread on media; and in a fourth puncture the diplococcus reappeared. To my mind this simply means that in the fluid obtained in the third puncture, the diplococci were so few in numbers as to elude search conducted with the ordinary care.

The earliest period at which we have found the diplococcus in cases of cerebrospinal meningitis of the epidemic type was within twenty-four hours after the onset of the disease; and we have established it as late as the fifteenth week of the disease. It is apt to elude search and fail to give any result on media in chronic cases, especially of the posterior basic type.

In this connection, the bacteriology of the fluids obtained from cases of tuberculous meningitis is of interest, and it may be said here that there has been much difference of opinion as to the presence of tubercle bacilli in fluid obtained by lumbar puncture in cases of tuberculous meningitis. Whereas, Lichtheim, Lenhartz and Bernheim found that tubercle bacilli were constant in the sediment of the fluid obtained from tuberculous meningitis, others, such as Cassell and Marfan, have asserted that their presence is only occasional. Our experience in this regard supports the contention of Pfaundler, that the discovery of tubercle bacilli in the fluid obtained by lumbar puncture in tuberculous cases depends much on patience and technic. This is well seen in our own cases. At a time when our technic was imperfect, when we did not centrifuge our fluids carefully, we failed to find the tubercle bacilli. Of late, however, we have made a special study of this question, and during the past year, of 14 cases diagnosed clinically as tuberculous meningitis, tubercle bacilli were found in 13 by subsequent lumbar puncture. To my mind this would prove absolutely that tubercle bacilli can be found by careful search in the puncture fluid of all cases of tuberculous meningitis. In some cases the search must be quite prolonged. In other cases, especially of children brought in late in the disease, we failed to obtain tubercle bacilli in the puncture fluid before death, but they were found to exist in abundant numbers in the fluid obtained by puncture immediately after death. It is hard to account for this apparent inconsistency, but I explain it by the fact that there is during life probably a constant wave of motion in the cerebrospinal fluid, thus securing the equal distribution of the bacilli throughout the cerebrospinal space. As soon as death accurs, this circulatory wave is suspended and a sedimentation occurs and the bacilli are thus obtained in the lower part of the canal.

Mortality.—It need not be said here that in epidemics of cerebrospinal meningitis the mortality among children will vary largely not only with the severity of the epidemic, but with the malignance of the infection. In some epidemics the malignant cases, that is, those which die within twenty-four or forty-eight hours, seem to be more numerous than in other epidemics. Of 37 cases of five years' service previous to the present year, which clinically presented all the classical features of cerebrospinal meningitis, 21 were absolutely substantiated, either by lumbar puncture or post-mortem, to be of the epidemic type. Of these 21 cases, the mortality was 42.8 per cent. Of the whole number of 37 cases, some were not punctured because the symptoms were self-evident; others were punctured but failed to yield but little fluid, with negative bacteriological results. Most of the fatal cases occurred in infants below one year. Of 15 fatal cases, eight were less than one year of age and two below two years. Thus, the older the child, the better its chances of conquering the infection. I have records, however, of cured cases in infants of five months, and one one year of age, in which the diagnosis of cerebrospinal meningitis of the epidemic type was substantiated by cultures from the fluid obtained by lumbar puncture.

Complications.—In the 37 cases of epidemic cerebrospinal meningitis which form the basis of this paper, we have noticed that the complications were exceedingly few. Those cases that recovered did so with very little to show that the nervous system in any of its extent had been severely compromised. The eyesight was not injured, nor was there in any of the cases a subsequent hydrocephalus. In other words, the recoveries, when they occurred, were complete and satisfactory. This is, of course, not due to any modes of treatment employed, but to the nature of the cases.

The most common complication seemed to be otitis. Herpes labialis was found in only two cases of the 37, and none of the cases presented joint complications, in this respect differing from the joint complications in the adult. I have lately seen one case of joint involvement. Erythemata and evanescent eruptions were observed here and there.

Most peculiar and striking have been several cases of the malignant type which I have seen this year, in which death took place within twenty-four hours after the initial symptoms appeared. In both of these cases there was a scarlatinous erythema. This disappeared and was replaced by a purpuric eruption, extensive in character, the skin of the infants and children appearing as if they had been beaten. Ecchymoses were blotchy and of wide extent distributed over the back, thorax, abdomen and upper and lower extremities. The diagnosis in these cases left no question of a doubt, being substantiated by the presence of meningococcus in the fluid obtained by lumbar puncture.

Posterior Basic Meningitis.—Still, of London, has given peculiar interest to this form of meningitis through his investigations of 15 cases of the disease. His clinical summary of the characteristics of these cases is quite classical and may be mentioned here for the sake of completeness: An infant becomes fretful, irritable, peevish, has one or more convulsions, vomits, and then in a few days the mother notices that the head is drawn backward, the limbs are rigid, and there is partial or complete opisthotonos. Quite a percentage of these cases last for weeks and may recover; others pass into the chronic stage, which may last for months, with complicating hydrocephalus. During the course of the disease, the rigidity of the neck, the retraction of the head, becomes extreme, and finally the infant passes into a condition resembling a tetanic state, with its arched back, its retracted occiput, the upper extremities in the position of extension, the hands clenched, very much as is seen in forms of tetany. The lower extremities remain in a condition of rigidity and of extension, and the feet and toes both extended. It was formerly thought that these cases were tuberculous; but Still has found that in 13 of his 15 cases he could isolate a diplococcus which to-day may be considered identical with the *Diplococcus meningitidis.* Still and Nutall both consider this form of meningitis a type of sporadic spinal meningitis, with the same etiology as that of the epidemic cases. Any one who has much to do with infants and children has seen these cases, and I have seen quite a number of them.

These cases have come to me in the hospital in the subacute stage, and, as is very often the case, I have had no opportunity until recently to make a post-mortem in a case of basic meningitis. In one case the fluid withdrawn by lumbar puncture was quite clear, resembling that of hydrocephalus. The fontanelle was bulging to a considerable extent, being open, and we drew off considerable fluid by repeated lumbar puncture. We have been unable, however, to cultivate the *Diplococcus meningitidis* from this fluid. The cytology in this case to which I refer showed a preponderance of mononuclear lymphocytes. In none of the cases have we been able to prove the tuberculous nature of the disease by the injection of cerebrospinal fluid into animals, and this, I am inclined to believe, would support the contention of Still that this type of cases is distinctly caused by the *Diplococcus meningitidis* and is to be classed with the epidemic cases.

I have recently been fortunate in obtaining a post-mortem on a case of posterior basic meningitis in the puncture fluid of which I obtained the *Diplococcus intracellularis* both by cover glass stain and culture. The history of the case is as follows:

Female child, aged two years, with a negative family history. The child had been born normally, had not suffered from any infectious disease; although a year previous had an abscess in the neck, which was cured in three weeks. No history of ear trouble; has always been a healthy, bright child.

Present History.—The illness was of five weeks' duration, began suddenly with fever and general convulsions; since then the child has felt better at times, and at other times, chiefly toward evening, the symptoms have reappeared. The child became stuporous since yesterday. The father thinks it is blind; it has vomited occasionally for the past three days. There have been sudden movements of the upper and lower extremities. During this illness the child has become much emaciated. There is no cough. The bowels and urination are normal. No previous history of traumatism. The father has not noticed any enlargement of the child's head during the illness.

Present Status.—The child lies with its head retracted and body slightly curved, the concavity somewhat to the left. There are occasional purposeless movements of all the four extremities, more marked on the right side. These are sometimes so limited as really to constitute tremors. The child starts at the least sound. Is unconscious. The eyes are open, pupils dilated, though they react to light. The forearms are extended from the arms, the hands clenched; the lower extremities are extended, the feet extended, as also the toes are flexed into the plantar surface of the foot. At times the child is rigid. There is rigidity at the back of the neck, and this rigidity is increased if the child is handled. At such times there is extreme episthotonos, the head is drawn back at an angle to the trunk. In other words, there is a spastic condition of all the extremities. The knee-jerks are increased; there is no clonus. The spasm at times is extreme, and a good deal of force is necessary to move the hands or legs. There is a tàche cérébrale. The respirations are very irregular, sometimes superficial and at others deep. There is no paralysis either of the muscles of the face or those of the orbit of the eyes. The ears are negative; heart and lungs show nothing peculiar. The liver normal to percussion; spleen palpable just below the free border of the ribs. Abdomen retracted. The skin shows a slight erythematous rash on the trunk. The throat cannot be examined on account of the fixity of the lower jaw.

The further history of the case is uneventful. The temperature was normal on admission, rose toward the close to 101° F. The pulse ranged from 100 to 140, being quite irregular at times. The respirations ranged from 28 to 48. Toward the close, the opisthotonos retraction of the head and rigidity became very marked. The child presented all the features that are characteristic of basic meningitis. The lumbar puncture was made in this case two days before the fatal issue, the child dying four days after admission to the hospital. A flocculent fluid was obtained which showed the presence of 73 per cent. polynuclear leucocytes and 27 per cent. mononuclear lymphocytes. The spreads and culture showed the *Diplococcus intracellularis,* negative to Gram. There was no sugar in the fluid. The child died suddenly in the afternoon of the fifth day after admission. A post-mortem was obtained in the brain alone, and showed a classical basic meningitis, as described by Still. The convexity showed only slight meningitis; congestion was marked and there were areas of opaque tissue in the pia of old organized foci of inflammation.

In the post-mortem made by Still, he found as an accidental complication recent or old tubercles in a few cases; but in these very cases he has been unable to find any tubercles of the brain or cord. On the contrary, he has established a diplococcus in the ventricular fluid, and therefore considers the tubercles as an accidental complication and not a primary cause of the disease.

Treatment.—The more we study the methods of treatment pursued in the management of cerebrospinal meningitis, the more we are led to the conclusion that the disease, very much like pneumonia, is a self-limited one, and that all we can do is to relieve the suffering of the patient and treat the complications. The results of treatment seem to be very closely connected with the severity of the epidemic and that of the infection in the various epidemics. Thus, in an epidemic in Oporto there is a record of 56 deaths in 91 cases, a mortality of 62 per cent. In other epidemics, the mortality has been quite low, 25 per cent., and in others higher than this percentage, as may be seen by referring to the section on mortality. And still in these epidemics very much the same treatment has been pursued, if we except one procedure, viz., that of lumbar puncture.

Much has been expected of lumbar puncture, and still, it must be said, comparatively little has been realized from it, in a therapeutic sense. Seager, in recording the mortality and treatment observed by him in cases of epidemic cerebrospinal meningitis, shows that by simple lumbar puncture 9 cases in 20 died, a mortality of 43 per cent. In the treatment by baths, 60 per cent. died. He then gives the statistics of the latest procedure, that of lumbar puncture, followed by the injection of a number of c.c. of a one per cent. solution of lysol. Of 31 cases treated by such an injection into the cerebrospinal space, 13 died, a mortality of 42 per cent. In the same clinic where Seager observed these procedures, 7 cases were treated with an injection of oxycyanide of mercury, and four died. Neither of these procedures prevented relapses in the cases observed by Seager, and these were quite frequent. In the epidemic in Oporto, 26 cases were treated by simple lumbar puncture. Of these, eight died, a mortality of 30 pr cent.

In considering the benefits of lumbar puncture in an epidemic of cerebrospinal meningitis, there are some, such as Osler, Wentworth, Concetti, Travers, Smith and others, who think that this procedure is of decided benefit to the patient, inasmuch as headache and delirium are relieved. My own experience, andthis is considerable, teaches me that we cannot say as yet that lumbar puncture is curative. Indeed, it cannot prevent relapses, as I have proven to my own satisfaction in cases in which the temperature had dropped after lumbar puncture, remained normal for a week, and then, without any apparent cause, a new attack was inaugurated. The fluid after the last puncture having been quite clear and sterile, possibly on account of the paucity of micro-organisms, became very turbid again and there recurred an intermittent curve, lasting over three weeks. I have seen the temperature rise after lumbar puncture, and the patient, on the surface, did not seem to have been benefited; but on a close study of the cases, I have found that the temperature is not a guide as to the efficacy of the procedure of lumbar puncture. Lumbar puncture certainly relieves symptoms of pressure, for in older children, who can describe their sensations, there is much relief after the withdrawal of 40 to 50 c.c. of fluid from the cerebrospinal canal. In fact, in one case, I remember distinctly a little patient of twelve years who actually requested (so severe was the headache) that the procedure should be repeated, inasmuch as it was the only thing that gave her relief. Therefore, if the irritability is great and headache is severe, as may be judged even in children by the rational symptoms, lumbar puncture is indicated.

Again, if rigors are frequent, lumbar puncture is certainly indicated, inasmuch as a certain amount of purulent exudate is thus withdrawn in the same sense as it would be indicated in a pleurisy.

Lumbar puncture is inefficient in certain types of cases in which there is extreme retraction of the occiput, rigidity and even opisthotonos (basic meningitis). In some of these cases, introduction of a needle is attended by no results; that is, there is a dry tap. It has been shown that in these cases there is danger of sudden dilatation of the ventricle, and what might have been relieved by the only procedure known in medicine, lumbar puncture, fails in the very cases in which it is most needed.

Again, lumbar puncture gives us a very good idea, in a prognostic sense, of the future fate of some cases. Where the cerebrospinal fluid is thick and purulent, and flows slowly from the canula, the prognosis is grave. I have not succeeded in saving any of these cases. Particularly encouraging are the cases in which the fluid obtained by lumbar puncture is of a cloudy appearance, at most showing a straw color.

In a procedure in which so little is known as to its efficacy, it is quite to be expected that all sorts of modifications should have been suggested. I refer to the injection of chemicals or antiseptic fluid, referred to above, such as lysol and the oxycyanide of mercury. To my mind, none of these procedures has lessened the mortality.

Our treatment has consisted simply of a lumber puncture whenever indicated by high temperature, continued excessive irritability of the patient, stupor, constant headache and delirium or rigors. Following out this method, we have felt that we had at our disposal a very excellent method, not only of relieving these symptoms, but of relieving pressure on the vital organs, the brain and the cord, at the same time withdrawing from the cerebrospinal space a certain amount of purulent fluid. In view of the fact that the bacterial life of the meningococcus seems to be a self-limited one, I doubt very much whether the procedure of lumbar puncture has a direct influence in shortening the disease. In younger infants and children, however, I do think that repeated lumbar puncture might aid materially in preventing certain complications, such as hydrocephalus following cerebrospinal meningitis, which, as you all know, is a very serious consequence with which to be confronted. Therefore, by relieving the pressure, we may possibly prevent in these young subjects a tendency which is present to dilatation of the ventricles and the accumulation of fluid therein.

Our experience with lumbar puncture has been quite extensive. We have never had an accident which could be attributed directly or indirectly to the procedure. Our method of performing lumbar puncture has followed closely that advised by Quincke. If we were unsuccessful and obtained what is known as a dry tap, we have repeated the puncture in another space, but we have not gone further than this. In several cases the primary puncture was followed by quite a profuse hemorrhage. Quincke thinks that this hemorrhage can be traced to the puncture veins in the subdural space. In none of the cases in which hemorrhage occurred have we seen any ill effects follow. In fact, the cases in which hemorrhage occurred made a good recovery without paralysis, especially of the lower extremities.

A peculiar symptom, which I have not noted elsewhere, is that of a desire to urinate at the time of the entry of the trocar in the cerebrospinal space. This, however, is only momentary and disappears as soon as the trocar is withdrawn.

As to the number of times which a case should be punctured there is, of course, no set rule. If the temperature remains down after a puncture, and the irritability and headache not very marked, it is well to hold our hand. If, however, there is a subsequent rise of temperature, we may puncture, though certainly not more often that at intervals of four or five days.

As to the quantity of fluid withdrawn in every case, this will vary. In some cases the fluid flows very rapidly from the canula, is quite clear or slightly turbid, and in a very short space of time 70 or 80 c.c. are withdrawn before there seems to be a relief of tension, which is judged principally by the rapidity with which the fluid flows from the canula. If the fluid flows slowly, drop by drop, we rarely withdraw more than 30 c.c. at a sitting.

Our further treatment, as published elsewhere, has consisted of hot baths for the rigors, sponging for the temperature; the intestinal canal was kept open with calomel, and we have administered in all of our cases iodide of potassium and sodium in full doses.

I have never made a so-called cervical puncture; nor do I think that lumbar puncture can be ranked with aspiration of the chest as an emergency procedure. Thus, given a case of cerebrospinal meningitis with a very high pulse, such as has occurred in my practice lately of 200, a condition of coma, and all the symptoms of malignant cerebrospinal meningitis, lumbar puncture has seemed of little avail, as practiced to-day.

In conclusion, I wish to express my thanks and appreciation to my former assistant at the hospital, Dr. C. F. Jellinghaus, who carefully compiled the statistics of this work.

NOTES ON THE EPIDEMIC OF CEREBROSPINAL MENINGITIS

By Henry Dwight Chapin, M.D., New York.

Early in March of this year, cerebrospinal meningitis, which is endemic in this city, began to increase in the number of those attacked. A glance at the deaths reported from this disease last year in comparison with those reported during the same months of this year shows such a marked increase as to justify us in considering it epidemic. The figures here quoted were kindly furnished by the Health Department.

During week ending	March	19,	1903..... 6	1904.....16
" " "	"	26,	" 7	" 13
" " "	April	2,	" 5	" 31
" " "	"	9,	" 9	" 29
" " "	"	16,	" 5	" 45
" " "	"	23,	" 5	" 55
" " "	"	30,	" 7	" 70
" " "	May	7,	" 6	" 76
" " "	"	14,	" 4	" 94
" " "	"	21,	" 10	" 69

In the limits of the short paper requested by the President, only a few of the salient points can here be enumerated. It is difficult to briefly draw a clinical picture of a disease so marked by irregularity in its manifestations, but an attempt will be made from a study of cases seen by the author and those reported by colleagues in the various societies. The onset is fairly abrupt, differing markedly in this respect from all other forms of meningitis. In getting a history it is usually possible to date the time of the beginning of symptoms to within a few hours, or even within sharper limits, before which time the patient has been apparently in good health. Generally there is vomiting, chilliness and rigors in older subjects, and frequently severe convulsions. The severity of the initial symptoms is apt to stand in some relation to the type of the attack. Thus prolonged convulsions quickly followed by coma will warrant a grave prognosis. There are exceptions, however, to this rule, as exemplified in a child of two and a half years, recently seen, who had convulsions at the onset lasting, off and on, for four days, and yet she made a good recovery in between two and three weeks. If stupor or coma quickly follow the convulsions, the case will be apt to be severe. In patients old enough to describe symptoms, complaint is made of severe pain in the head and back of the neck. The typical retraction of the head is an early symptom, usually noted on the second or third day. In very mild cases this may not be so marked, but in average and severe cases the rigidity is often extreme and hard to overcome. The posture of the patient at this time becomes characteristic, and, with the opithotonos, the thighs and legs, and even the arms and hands, are apt to be in a condition of more or less extreme flexion. The contraction and rigidity usually continue during the course of the disease. After this characteristic beginning, cerebrospinal meningitis is most irregular in its manifestations, particularly in the epidemic type. Cases that appear to be rapidly proceeding to a fatal ending may suddenly improve, and those that do not show very urgent symptoms may just as suddenly and unexpectedly die. A glance at some of the clinical features noted during the course of the disease as here given has been taken largely from cases studied in the children's ward of the Post-Graduate Hospital, with the kind permission of Dr. Caille, who is at present on duty. With reference to the nervous systems, conculsions may first be noted. As already stated, the clonic spasms occur early in the disease, but they may be severe and persistent. In one case a baby of three months had repeated convulsions covering a period of five days, and in a case previously mentioned this alarming symptom lasted four days. It is unusual to have convulsions later in the disease. The tonic spasm of the muscular group at the back of the neck is one of the most constant features, with little or no relaxation until late in the disease. Hyperesthesia of the skin is noted, as in all forms of meningitis. The patients show every evidence of discomfort on being disturbed, partly from this cause and partly from aggravation of the pain in the head and neck. The mental state runs the gamut from apathy and indifference to great irritability, delirium, drowsiness, semi-stupor, stupor and coma. Some of the cases went directly from convulsions into stupor, and this is very apt to take place. Kernig's sign may be recognized in nearly every case. All of the cases in which the blood was examined exhibited more or less leucocytosis.

The temperature and pulse show remarkable variations and present no characteristic features aside from this variability. There is no apparent cause for these wide fluctuations. One case, a child three and a half years old, is worth special mention. On one occasion the temperature rose to 108.6° F., once to 106.4° F., and three times it was above 105° F. The pulse varied from 100 to 160 and the respiration from 24 to 48. There was initial vomiting, followed by irritability, rigidity of the neck and then marked apathy. An ounce of turbid fluid was withdrawn by lumbar puncture and the *Diplococcus intracellularis* found. Leucocyte count, 21,200. Dr. Davis found neuroretinitis in both eyes. The child is now convalescing favorably. Another case, six and a half years old, had a temperature of 106° F. and 107° F. on the second and third days respectively, after which it gradually dropped to 99° F., the pulse varying from 150 to 85 and the respiration from 44 to 24. An ounce and a half of turbid serum removed by lumbar puncture and *Diplococcus intracellularis* found. Eyes normal. This case has so far done well. Another case, three and a half years old, started with vomiting and convulsions, followed by delirium. During fifteen days the temperature varied between 103.2° F. and 98.6° F., when it rose to 106.4° F. and the child became much worse. As he was apparently dying, the parents wished him removed to his home. Lumbar puncture dry. Mild neuroretinitis of both eyes with dilatation of blood vessels. While the temperature is thus most irregular in cerebrospinal meningitis, and may reach an extraordinary height, some cases may run their course with little increase of temperature. The pulse, while variable, is not apt to exhibit the marked intermissions so frequently seen in other forms of meningitis, The respiration likewise differs from ordinary meningitis in not usually being so irregular and sighing. In previous epidemics there have been many cases of croupous pneumonia reported as occurring during the time that cerebrospinal meningitis was prevalent. The frequency, severity and mortality of pneumonia during the past winter and spring have been noted by all physicians in this locality, thus corroborating previous experience in this respect. The skin seems seldom to be involved in the present epidemic. No case has been seen by the author exhibiting the purpuric spots over the body, from which the old name "spotted fever" was derived. In conversing with others who see cases, the rarity of the eruption has been likewise noted. The eyes are often more or less involved, with dilatation or inequality of the pupils and sluggish response to light. In four cases seen by the author there was a mild neuroretinitis of both eyes, and in one case dilatation of the retinal veins on both sides was reported. It is possible for all the structures of the eye to become inflamed, with consequent loss of sight. Some cases exhibit a mild grade of conjunctivitis. The ear is likewise involved in a certain proportion of cases. A subacute inflammation may take the form of an otitis media or an involvement of the labyrinth, followed by deafness. The general course and duration of the disease is most irregular. A mild case may go on to recovery in two weeks, while severer ones last many weeks and even months. The patient may get in a condition of extreme prostration and emaciation and yet gradually go on to recovery. Unfortunately there are cases where the brain is permanently crippled by the ravages of the disease and the patient never regains his former mental and physical strength. The special senses may likewise suffer loss or permanent disability. The cause of the epidemic of cerebrospinal meningitis is now recognized to be the *Diplococcus intracellularis,* which is found in the fluid procured by lumbar puncture. This fluid is usually turbid when drawn. The diplococcus was thus found in all the cases thus examined except two, one of the latter giving a dry puncture and the other a clear fluid, the culture from which gave no growth. The manner in which this germ gains access to the cerebrospinal meninges as well as its port of entry appears to be uncertain. The nasal secretions are now being studied, the results of which will doubtless be given in due time by the bacteriologists. In one case, a baby of three months, some turbid serum drawn from the spinal canal showed the diplococcus and an eye-smear was reported to exhibit gonococci or the diplococcus of meningitis. As the eyes were normal to examination, the latter was evidently the germ recognized. Several mild cases have only been recognized positively as cerebrospinal meningitis by the results of the lumbar puncture. In one case, a young infant, with an obscure history, was admitted to the hospital and, after an examination, there was a question as to diagnosis, as there were no characteristic symptoms present. A lumbar puncture was then performed and the diplococcus found, in the absence of which no positive diagnosis would have been made. Doubtless in this epidemic, as in preceding ones, some mild cases are never correctly diagnosed, especially in young infants. There are no means of knowing how many such cases occur, hence it is very difficult in this as in other epidemics to state the relative mortality of the attacks in different years. We know, however, that the death rate is high. In the epidemic of 1892, 782 deaths were reported during the year in New York, and in 1881, 461 deaths. This included only what now forms the Borough of Manhattan, with a population much smaller than now. The disease does not seem to be limited to any one section of the city, but generally, it occurs in the poorer quarters. It seems to attack by preference those living in unfavorable hygienic surroundings, or those whose systems are exhausted, especially if they live in a depressing environment. While the spread of this disease is certainty a calamity, there does not seem to be occasion for undue alarm in the public mind. The Department of Health is studying the epidemic and doing all in its power under the conditions to find out how the disease extends and acts. It does not act like a contagious disease that spreads from one adjacent point to another, frequently being traced by transportation, but rather appearing in comparatively isolated localities. Most of the epidemics in this country and Europe have extended principally in winter, so that, reasoning by analogy, the onset of warm weather should have a favorable effect in checking the epidemic's influence.

CEREBROSPINAL MENINGITIS IN BROOKLYN*[1]

BY WILLIAM BROWNING, M.D.

PROFESSOR OF NEUROLOGY AT THE LONG ISLAND COLLEGE HOSPITAL.

Besides the occurrence of distinct epidemics of cerebrospinal meningitis, it is well known that sporadic cases are observed and that in many localities these are so frequent as to give it an epidemic character. This fact has been established in this country largely by the well-known report of the Massachusetts Board of Health of 1898. But there are many communities where this has not been specifically demonstrated, and probably in none is its importance fully realized.

It is my purpose simply to put on record a limited number of personal observations, with a discussion of certain points, and collect any further references to its occurrence in Brooklyn.

The few cases of which some details will be given were seen in private practice, one being subsequently removed to hospital for operation. So far as my observation goes, such cases are but rarely brought to our hospitals—although possibly turned into some other than the nerve-service.

Evidently the germ is widely and continuously present here in Brooklyn, and the possibility of an epidemic always with us, should the unknown favoring conditions arise.

The first two cases are given because they occurred at the same time in the same family, and as in one the presence of what is now known as Kernig's sign was noted. In the next five the presence of the *Diplococcus intracellularis meningitidis* was demonstrated, and thus, according to prevailing views, their true character established. For this I have often been indebted to Dr. E. H. Wilson, Director of the Bacteriological Department of the Hoagland Laboratory. As, according to him, these are the only cases in Brooklyn in which this has been done, they acquire a primary value. Of course, other cases might be added, but particulars will only be given of those in which the germ was found or that have some special interest.

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*Paper read before the Brooklyn Society for Neurology, Feb. 13, 1904.

[1] Courtesy of *Brooklyn Medical Journal.*

It may be asked, how many suspected cases have failed to give such positive results? Dr. Wilson's record shows but one, and in that, an uncertain case, some contamination of undetermined nature was found. Consequently I believe the symptomatology, if carefully studied, sufficient in most instances to warrant accuracy in diagnosis.

I. Girl, 10 years old, seen March 17, 1889, with Dr. Charles Jewett, at Bedford Ave., near Willoughby.

Four days previously she came in from play in the afternoon and had a 15-minute chill; then complained of pain in the back and vomited. Has since been restless. Pain in various parts of the body, as across the forehead, in the right side, etc., causing her to keep up more or less moaning, and requiring an opiate. The fever has run about 101.0 in the axilla. Bowels have moved freely, in part from calomel. Mild delirium much of the time. Yesterday opisthotonos developed with increase of the ache in head and back of neck. The right lower extremity she now rarely moves, and at times it is insensible to pricking. The right arm also is less used now. Bladder acts well. There has been no special amount of perspiration, though beads of sweat are now noticeable over the head.

Lies with the head retracted; drawing it forward slightly soon causes pain. When almost any tendon in the body is stretched and directly passed against, pain is complained of. Slight pressure, just of the skin, is somewhat sensitive over the leg, left side of abdomen and elsewhere, though deep pressure at the same places is but slightly so. The skin feels hot and feverish. Pulse fair, a little fast. Breathing regular. Sensorium fairly clear when aroused, *i.e.,* she then recognizes people and answers simple questions.

No noticeable photophobia. Sees better with the left eye; on waking her from a doze the right diverged outward and upward. On full illumination the right pupil is now very small and practically fixed, the left wider and very variable; on arousing her the left seemed to react promptly to light, but soon again exhibited continuous spontaneous change. She lies steadily on the right side, moving arms and legs some, especially those of the left side. The tache cérébrale on stroking the chest is neither prompt nor very marked. No knee-jerk obtainable. On flexing thigh on trunk and then trying to extend leg, considerable latent contracture is found (described by Kernig in 1884, and now named after him). Weak plantar reflex. Abdominal reflex present.

Thirst. Several herpes patches about mouth. Tongue somewhat coated, with prominent papillæ.

On May 11, *i.e.*, two months after onset, Dr. Jewett informed me that this girl had recovered. A right hemiplegia (arm and leg) developed more fully, but was recovered from. The opisthotonos lasted some time. When last seen, the pupils had not quite recovered equality, and some sensations on left side of head were still complained of.

II. Sister of preceding case, 19 years old, seen at same time and place, but with Dr. Van Deusen. History of an attack of lead colic about a month ago.

The day after that on which the younger sister was seized, this girl remained out until 1 A. M. On coming home she had an indefinite chill, pain down the right lower extremity, and vomiting. Since then there has gradually developed pain in the right arm, in back and forehead; mild delirium, low fever, and restlessness. Moans. Has been so wild and excited as to require sedatives. Breathing now irregular. Complains of pain in the right leg. Rolls back and forth on any attempt at examination of eyes. Occasional divergence of eyes when in a doze. Light reaction uncertain. Mouth dry; lips parched; black sordes on teeth. Knee-jerk present on right, at least. Some latent contracture in the right lower extremity, if not in both. Radial reflexes even and normal. Sensorium quite clouded, making the impression of a somnolent morose person enduring suffering. Constipation and anorexia since onset. Marked photophobia has been persistent. This patient died within a day or two.

III. Boy of 13 years, seen with Dr. E. P. Hickok, October 13, 1900, at Euclid Ave., East New York. Works in an office in Manhattan.

After a severe wetting in the rain he was taken on the evening of October 9 with a chill, violent fever and delirium. At first treated by another, but now since night before last in Dr. H.'s care. He found the boy exceedingly restless and delirious, so that they were unable to keep him covered in bed; tongue parched like a board, sordes, T. 101.0 in the rectum (though the skin felt normal). The pulse at the wrist was hardly discernible, 125-130 over the heart. Slight constipation, after an asserted primary diarrhea. Constant vomiting until Dr. H. took charge, but none since.

Yesterday more decided retraction of the head. To-day the pulse is 136. Urine showed no albumin; sp. gr. 1025. One herpetic patch on upper lip over left corner of mouth. Tongue coated. The arms show just normal radial jerks. He is conscious this morning, moaning slowly most of the time. No knee-jerks. There is a spotted eruption over the extremities. Babinski normal on each side, though not constant. Some plantar reflex, temperature 102.2. Tension in muscles of lower extremities, not of upper. Tache cérébrale well marked. Pupils equal and react promptly.

One ounce of opalescent fluid was withdrawn by spinal puncture, the pulse falling to 120. Dr. Wilson found the meningococcus in "pure culture."

He improved well after the puncture, but went out too soon and had a severe relapse. He, however, eventually recovered, requiring the Doctor's care until into December.

IV. A boy in Middleton Street, seen April 14, 1901, with Dr. F. H. Clark. I first saw him at the house and did a spinal puncture. The fluid was found by Dr. Wilson to contain the meningo-diplococcus. The patient was then removed to the Bushwick Hospital, where, on April 27, Dr. Clark trephined at the base of the occiput. It was a severe case running a fulminant course. But after the operation his mental condition cleared up markedly, and for a week or two he appeared to do well. Then he rapidly retrograded and died.

The operation was undertaken because in other cases considerable relief had followed spinal puncture, and it seemed warrantable to suppose that more prolonged and effective drainage might prove successful. This is but ordinary surgical teaching—to drain off all or as much infectious material as possible. Although it failed in this case, still temporary improvement occurred and the boy apparently lived longer and more comfortably in consequence. The reason for choosing the occipital site for the opening need not be discussed here further than to say that it gives the freest drainage (directly opposite the ventricular outlet of the fluid, the foramen of Magendie), and with least chance of return-infection.

A case, supposedly of this disorder, was treated successfully by laminectomy of the seventh and eighth dorsal vertebræ and drainage for 40 days, according to Rolleston and Allingham (*Lancet,* 1899, April), although the case was of course unknown to me at the time of our operation.

V. Mrs. B., 23 years old, seen with Dr. E. P. Hickok, January 9, 1903, on Snediker Ave.

Is the mother of two children. Has been generally healthy, though of rather spare habits, "not over strong."

When a child, living then also in East New York, she had what was called "brain fever." From Dr. Vermilye, who attended her at that time, I learn that it was a true typhoid fever with meningeal complications, and probably not an earlier attack of her present trouble.

This began on December 25, 1902, when she had a chill followed by a little sore throat, "apparently just a little grip attack." For that the Doctor only had occasion to see her once. She soon was about again, and even went out.

She is said to have walked four or five blocks bare-headed on January 4. On the following day, the 5th, the Doctor was called again, as she had "a terrific chill." She then complained of severe headache and had a high fever. At first a pneumonia was suspected.

On January 6, the mouth temperature was 103.0. There was then persistent vomiting and severe occipito-cervical pain. The temperature since has ranged from 102.5 to 103.5, and last night was up to 104.0.

The pulse was over 120 at first, but has since been down to 105-110.

Yesterday she began to complain of indistinct vision. But she has continued all this time rational, unless a "little flighty" when quiet.

Has had two hypodermics in all, though constipated even before any opiates.

Pulse now 168 and weak. "She has been quite flighty all night"; she, however, talked to us naturally. Says the pain is now frontal and occipital. The last vomiting was the evening of January 7.

This morning for the first there appeared a squint which proves to be a complete paralysis of the left external rectus.

She, however, claims not to see double even when the eyes cross. Temperature 100.4; hands, neck and surface generally do not feel specially feverish to the touch. Spleen not large. A couple of small red spots on the back, blanching on pressure. Moans a great deal. Since yesterday, some distinct stiffening of back of neck. No particular tension of muscles of extremities, though she objects to testing therefor.

About an ounce of fluid was removed by lumbar puncture and submitted to Dr. E. H. Wilson. He reported the presence of the typical meningeal diplococcus. The case ended fatally.

VI. Adolf F., 17 years old, upper Greene Ave., seen with Drs. Bender and Hoople, December 5 and 9, 1903.

Chorea four or five years ago. Troubled also with a running of the right ear, "as a boy and some two years ago, but not since." Said to have been feeling "poorly" before this. Complained of headache daily all this year, mostly right-sided, but at times occipital or all over. "Wasn't lively and had a poor appetite all summer." Father said to be a hard drinker. An older sister was neurasthenic; the other children are younger.

The present trouble started two weeks ago with "grippe," enlarged tonsils, and a rise in temperature to 103.0. A brother of his was suffering at the same time from a like attack, together with swelling of the cervical glands. The patient is "otherwise a good boy, well-behaved," but at present is somewhat ugly. There was no chill.

The following day (*i.e.*, just two weeks before I saw him) he was uneasy, ran up a temperature to 103.5, and vomited twice. But his head remained "tolerably clear." "His hearing was all right that evening." But by the next morning "his hearing was absolutely gone" in both ears. "But he was less uneasy, and answered" questions put to him on paper. Dr. Hoople saw him at this time, and to him I am indebted for much of the information as to his then condition. His pulse was 140 and very small. R. 28. Slight opisthotonos. Some trifling tenderness below the right mastoid, but none from direct pressure on either mastoid itself. A large perforation in the right drum. No pus, odor, discharge or sign of recent inflammatory reaction. Pupils were equal and reactive to light.

Disc normal in both eyes eleven days ago, unless slight enlargement of retinal veins. No ocular weakness, except slight photophobia. V. R. 20-30, V. D. 20-20.

There was a trifling discharge from the right ear three days ago, and yesterday a purulent, bad-smelling discharge from the same.

Three nights ago, "loss of motion in left arm and leg . . . appeared during the night"; by afternoon he could squeeze some with the left hand and that hand and arm had improved ever since (is left-handed). Left side of face smoother than right, but he can still whistle a little. The left lower extremity has improved but slightly.

The R. dropped to 10 at the time of this hemiparesis, then gradually rose to 23-4 again. No vomiting. "There was never any slow pulse." Temperature down to 99.2 or 100.0 in the morning, and up to 101 or 102 in the afternoon. Excess of phosphates is the only thing notable about the urine.

On paper he now answers promptly and very sensibly, though at first, after the paresis, his replies were slower and more difficult. Was also "sleepy at that time." No pharyngeal reflex. He is now deaf even for the extreme notes up or down; tinnitus, however, of the right ear since the deafness.

Can wink either eye alone, and scowl on both sides. Tongue comes out straight. He answers written questions with a natural voice and a good, even sound, surprisingly so for one totally deaf.

Arm reflexes equal and not increased; trifle biceps, though very slight radial. Pulling hairs over forearms or legs appears equally sensitive on the two sides. No ankle-clonus on either side. Knee-jerk is faint on the left, and perhaps a trifle stronger on the right. On the right the Babinski is normal; on the left a normal reaction to the outer toes, but the big and adjacent toes jump upward a little. There is a tendency all the time for the head to turn to the right. He keeps a very close watch of everything going on around him.

Seen again December 9. "His cerebral functions seem to be a little slower." Involuntary evacuation of bowels twice in the night of December 7-8. To-day, part of the time he calls for urinal when needed and again not. In answering questions, he does it once or twice, "then he will play with the pad or look at you." "There seems to be less spasm of the cervical muscles." He no longer turns his head specially to either side. "He takes about two quarts of milk in 24 hours, and swallows quite well." Some nystagmus. Rectal temperature, 99.5 mornings, and 101 or more in the evening. Pulse 100-118. Marked retraction of head. "He complains nearly all day to-day of headache. Popliteal tension is present. No plantar reflex, at least on left. Normal Babinski on the right, except that the big toe retracts upward.. No definite knee-jerk either side. No abdominal reflex. Epigastric present on right, but indefinite on the left.

Spinal puncture gave a slightly turbid fluid, which was found by Dr. Wilson to contain the characteristic meningo-coccus.

The young man from that time on improved, and in a general way has now recovered from his attack. But, as usual, in that complication the deafness does not show improvement. Such occurrence of sudden, complete and lasting deafness early in this disease is not unknown; but when it develops in a person previously afflicted with attacks of ear-trouble it may well constitute a diagnostic puzzle.

VII. Dr. Wilson has record of a fifth positive case of mine, but I have not been able to trace it (possibly from some institution, or passed without notes).

UNRECOGNIZED CASES.

From various observations and facts I have a strong impression that many slight forms and obscure cases of infection with this organism pass without recognition of their true nature. Especially must this apply to sporadic cases. The more frequent resort to a bacteriological examination of the spinal fluid in uncertain cases would extend our knowledge in a useful direction.

Even in the last detailed case above, where two brothers were attacked by sore throat, etc., the one showing swollen cervical glands and the other developing meningitis, it must still remain a question whether the latter was an added infection to the tonsillitis or whether the primary throat trouble in each may not have been due to or complicated with special coccus infection.

VIII. I well remember one such case on my block in Grand Avenue, first seen in October, 1900. A young man not out of the teens had an obscure run of slight fever, but with continuous deep headache and an inexplicable stupor or mental lethargy. For a time the nature of the trouble could not be suspected. The development of moderate retraction of the head and nuchal pain and the knowledge of another case in town indicated the diagnosis. He made a fair recovery, but his progress was exceedingly slow. For months any little excitement or mental over-effort brought on headache and distinct evidence of intracranial pressure. He tried his old position, but could not keep at it long, because of his head. A long stay at Bermuda brought a more definite cure, though for more than a year some symptoms could still be brought on by the old causes.

Two other milder but possibly similar cases, in married women of middle life, I have seen since. The one was in the practice of Dr. Maddren, and at first looked ominous; but care and a due amount of time to work in brought about a cure. The other was seen with Dr. J. B. Bogart; a neurologist from out of town flippantly dubbed it a neurasthenia, advised activities of various sorts, and made a prognosis of easy recovery. When next heard from, some months later, she had become a "sanitarium chaser." In time she made a fair recovery. The different course run by these two originally very similar cases indicates the importance of a correct view of the facts.

EXPLANATION OF SEQUELÆ.

The usual explanation of the after-conditions that we see persist more or less obstinately is that they are due to direct compression and destruction of outgoing nerves by the inflammatory material, or to the scars from shrinking exudate. And without doubt this does apply to such things as deafness, paralysis or paresis, and the like.

But we also know two general facts: 1. That the course of recovery in these cases, where it occurs, is exceedingly tedious—far more so than from any other infectious disease that I recall. 2. That there is a group of special symptoms in these recovering cases that only occur under special conditions. So long as the patient keeps bodily quiet, mentally inactive, and there is no fever or other disturbance, the patient is comfortable. But if these factors come into play, a series of complaints and symptoms like those in the last-mentioned case make their appearance. Such persons are often unable for a long time to resume their occupation, although feeling equal to it until they try.

All this class of subsequent phenomena can, I am sure, very properly be attributed to the blocking of the efferents of the spinal fluid by the inflammation and its products. It also explains the extreme slowness of recovery.

Correspondingly, remedies acting in that sense give the best relief. In a warm atmosphere and begun gradually, such a person is soon able to take a good amount of physical exercise, and in fact, in that manner can aid the development of new efferents. For immediate relief, quiet, absorbents, warmth to extremities, mild depressants, etc., serve best.

Infection.—More definite knowledge of the sources of infection in these cases is desirable. The *Mass. Report,* p. 165, says: "Reports as to the contagiousness of the disease vary, but the general opinion is that the disease is not propagated by contagion. In this epidemic (111 cases) there were seen several instances in which two cases came from the same house and family." And on p. 24: "The evidence, on the whole, is not conclusive that the disease is incapable of being transmitted from one individual to another." While these conservative or confusing statements may be sufficiently true to serve as an index, they are far from being either complete or exact.

Especially does there appear to be a possible source of danger in the now frequently practiced spinal-puncture in these cases. The fluid usually leaks or runs out to some extent over the hands of the operator and thus must often come in contact with an abrasion; it may also drop on the bed-clothes and there dry and be scattered. The following facts bearing on these queries, as kindly suggested to me by Dr. Wilson, indicate, however, so far as experiment well can, that the operator runs little or no risk, but are indecisive as to the other danger.

Weichselbaum (*Fortsch. d. Med.,* 1887, Nos. 18 and 19) produced the disease by subdural injections, and if preceded by brain lesion, also even by intra-venous injections, in either case of cultures of the bacillus. Subcutaneous injections, he found, did not succeed, although intra-peritoneal or intra-pleuritic gave positive results,—the resulting changes, however, not exactly like those seen in the human.

Jaeger (*Zeitschr. f. Hygiene,* Vol. XIX, 1895, p. 351) found guinea pigs amenable to intra-pleural and intra-peritoneal injections. "The nasal secretion of the meningitis patient regularly contains the parasites." He holds further that this is the career of the contagion, and that it resists drying. Handkerchiefs and the like should be specially disinfected, he says.

Roger, in his treatise (1903, p. 426), says that "this pathogenic organism invades the economy through the nasal fossa." And Schiff (1898) claims to have found it in the nasal cavities of healthy individuals. We now know, however, that the mere finding of diplococci in nasal secretion should not be considered conclusive.

The usual habitat of the bacillus outside the human organism does not appear to be known. Possibly, like the pneumococcus, it lurks in the nasal and adjacent spaces of many individuals.

Netter, of Paris (*20th Century Practice,* Vol. XVI, 1899, p. 211), concludes that the germ may persist in a locality for months, although summer, with its open doors, air and sunshine, chokes it out.

The mode of infection may, therefore, be considered as determined; but the source and favoring causes of this are still uncertain.

The initial or precedent throat trouble in certain cases of the present series is very suggestive in this connection; grip-chill with sore throat in VI; tonsillitis in VII; even the severe wetting in the rain (IV), and, finally, a case of Dr. Winfield's, in April, 1889, that began with or was preceded by spasmodic croup, followed by fever convulsions, erythema, opisthotonos and death in three days (the real character of this case I was unable to corroborate by autopsy). Apparently in these cases the inflammatory or obstructive trouble about the throat or nose produced a condition that favored or forced the entry of the meningeal coccus into the system. Perhaps more careful attention to this feature in the anamnesis will clear up one factor in the individual's infection. To make this applicable to the more distinctly epidemic forms we must presume that from some source there is at such times a far greater prevalence of the infective organism.

Analogous observations referring to the upper air passages, accessory sinuses or ears, have been noted by Weichselbaum, Strümpell, Orthman, Netter, Scherer, Weigert, etc., although Netter claims there are epidemics and cases in which no nasal complications occur and in which the agent enters through the pulmonary alveoli.

Mortality.—The mortality of this disease varies considerably with time and circumstance. It is usually given as about 50%, but in epidemics as high as 75%, or, on the contrary, in isolated cases, down to 20% or lower. Without doubt, as usually given, it is for two reasons too high. In the first place, only the severer cases get into hospitals or are likely to be included in health reports, and it is upon these that such figures are largely based. On the other hand, in sporadic cases it is inevitable that many, and naturally the lighter, should fail of recognition. The cases detailed in this paper were too few in number for much value, and as consultation cases, most of them must have been above the average in severity.

CEREBRO-SPINAL MENINGITIS IN BROOKLYN.

So far as I am aware, no special article on this disorder in Brooklyn has appeared, aside from what is given in the weekly and annual reports of the Board of Health. While spotted fever, as it was called, had doubtless occurred here previously, the first distinct mention of it was about the time in the early sixties, when this disease was epidemic and disastrous in so many parts of the world. In the *Trans. Med. Soc. of the County of Kings,* for February, 1864, Dr. Minor briefly reported a case: "The most prominent symptoms were opisthotonos and great prostration. The patient recovered." A case reported by Dr. Conklin the previous year was of another nature. In April, 1864, Dr. D. S. Langdon "Reported two cases of cerebro-spinal meningitis. They were characterized by the appearance of rubeola-like spots, more livid towards the last, tetanic spasms and fatality. On post-mortem the meninges of the brain and spinal marrow were found to be intensely inflamed." At the same time reports of cases by others were made.

The *Proceedings* of the Society, 1876-1883, contain no reference, nor does the volume of the Pathological Society (1885-6).

Excellent general articles may be found in the *Brooklyn Med. Jour.* for March, 1902 (p. 151), November, 1902 (Hotchkiss, p. 481), and September, 1903 (Frank Little and others).

STATISTICS FROM THE BROOKLYN BOARD OF HEALTH.

Since the merger of 1898 into the greater city, the facts for Brooklyn must be taken from the New York reports, but as the classification is supposed to have changed somewhat, I shall confine myself mostly to the period just before that.

It required an unexpected amount of work to glean the statistics buried in the health reports. With regard to this disease they are, for the later years, only to be gathered from the weekly sheets, and even there the figures are not always or correctly given in the total summaries for the week. It may be queried whether they are of value when found or whether the net results were worth the labor. As the figures include only the mortality, they represent but a fraction of all the cases that occurred.

Still, it is warrantable to collect all the available information bearing on the disease as it appears here. It is certainly not such a rare trouble as to have merely a theoretical interest. And our community is large enough to warrant the special study of any disease that occurs with any frequency within our borders.

The health reports of the old city of Brooklyn from 1851 to 1861 inclusive (the later ones giving tables back to 1848), make no mention of this disorder. The large number of cases of congestion and of inflammation of the brain suggest that it may have been included under those heads. Published reports from 1862 to 1865 inclusive, as also from 1870 to 1871, I have been unable to find.

The following table summarizes the findings for the 19 consecutive years, 1879 to 1897 inclusive. Those for the last three of these years, however, cannot be given by wards.

It may be explained that the ward boundaries were somewhat changed in 1892, affecting especially Wards 9, 18, 22, 23, 25, 27 and 29. Also that 26, 29 and 30 were not in the city limits until into the nineties. In the two wards, 6 and 14, however, having the largest number of cases, there was no change in area, nor again in the older wards having the least.

BY MONTHS (FOR 1879 TO 1897 INCLUDED).

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
34	31	42	55	54	37	38	28	39	35	34	17	444

This shows a somewhat greater incidence in the three spring months. Even in the more epidemic outbreaks, the greatest frequency has been found to be in the spring, or winter and spring months.

Years.	Wards.																														Totals by Years.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1879	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	4
1880	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2
1881	..	..	2	1	..	7	..	1	..	2	..	1	1	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	18
1882	..	..	..	..	3	..	..	..	..	..	..	.	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	5
1883	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
1884	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
1885	..	..	..	1	4	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
1886	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
1887	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
1888	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
1889	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
1890	..	..	1	..	1	4	2	..	1	2	3	3	3	9	3	..	2	8	1	..	1	1	..	1	6	..	..	..	..	..	52
1891	..	..	..	..	1	8	5	9	3	3	1	2	7	14	4	2	2	7	..	2	6	8	..	3	2	2	.	..	..	..	91
1892	5	..	1	1	3	7	3	5	1	6	2	2	6	14	3	6	4	4	2	3	4	5	1	2	7	2	..	2	..	..	100
1893	2	2	..	4	4	11	5	7	2	3	5	5	6	9	2	8	11	4	3	4	2	7	4	5	4	2	2	5	..	..	128
1894	..	..	..	..	..	1	..	2	..	1	1	1	..	1	..	..	1	..	..	1	..	..	..	..	3	1	..	..	..	..	25
1895	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
1896	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
1897	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Totals by Wards	7	2	5	7	17	39	16	25	7	18	13	14	23	50	12	16	20	25	6	11	16	21	5	11	25	7	2	7	..	..	444

	Population by Wards, 1880 and 1890.																													
1890	24,000	11,000	24.500	16,000	21,000	50,000	44,000	45,000	42,000	49,000	27,000	38.000	30,000	33.500	34,000	48.500	51,000	23.500	41,000	32.000	61,000	59,000	55,000	27,000	50,000	47,000	36.500	58,000	......	......
1880	18,729	9,254	18,271	12,819	18,517	35.437	31.633	17.388	15,044	27.140	21 080	22.201	21,029	25 559	23.654	42,712	30,088	23,926	27.661	24.188	31,956	25,473	14,396	8,823	19,055	13.655	......	......	7.634	3.674

MORTALITY.

Year.	M.	F.	Total
1866 (6 months to Sept. 30)*	..	..	3
1867 (one year to Sept. 30)*	5	3	8
1868 (one year to Sept. 30)*	6	7	13
1869 (one year to Dec. 31)*	4	5	9
1872	142	126	268
1873	56	58	114
1874	16	12	28
1875	..	..	18
1876	..	..	20
1877	11	9	20
1878	6	10	16

In explanation of the above figures it may be again stated that they are derived by adding up the mortality as published for each week in the year. The numbers vary considerably in the earlier years from the totals subsequently given by the Department itself in the report for 1884 (covering the years 1877-1884). For some of these years two tables are given, one of deaths, the other of "cases and deaths by ages and sexes."

For 1877, p. 37, 19 cases and 12 deaths.
For 1878, p. 47, 10 cases and 8 deaths.
For 1879, p. 60, 2 cases and 2 deaths.
For 1880, p. 77, 10 cases and 3 deaths.
For 1881, p. 95, 40 cases and 34 deaths.

We hear health statistics condemned because of the asserted untrustworthiness of most diagnoses. But here we find, even in the office figures for 1879, 1880 and 1881 (by comparing those just quoted in the table) discrepancies such as no man of ordinary intelligence can hope to interpret. (It was impossible to apply the test of classification by age, since, according to the Massachusetts Report, p. x, "the disease is extremely rare among infants as well as those of advanced age.") Although we must conclude that from any exact point of view such figures are untrustworthy, it does not follow that they are worthless; the gradual rise and fall in mortality, the wide distribution in the town, the correspondence with experience as to seasons, all indicate that in a broad and average way they tell the truth.

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*The figures for 1866-9 are from Reports of the old Metropolitan Board of Health.

All the others to 1897-8 are from Reports of the Brooklyn Department of Health.

According to the New York City Health Reports it appears that the deaths from this disease in Brooklyn numbered 82 in 1898, 94 in 1899, 93 in 1900 and 57 in 1901.

One cannot but be struck with the sudden variation in mortality from this cause, on any great change in the official side of the Health Department—as when the Metropolitan Board gave place to a local one, or again, when the local was transferred to the enlarged city.

According to information very kindly furnished by Dr. Raymond, Chief of the Borough Department of Health, under date of December 16 and 18, 1903, it appears that despite the requirement of the Sanitary Code, "the reported number of these cases during life is a negligible quantity." "Occasionally some one sends in a report, but it is very rare." "The deaths from epidemic cerebrospinal meningitis (Borough of Brooklyn) in the year 1902 were 55, and for 1893 up to date also 55." These figures may not be exact, as they came from some subordinate, and in none of the cases, so far as known, has a bacteriological diagnosis been made, except those detailed in this paper. In addition to other points, it is this definite proof of the occurrence of the disease in Brooklyn that is now offered.

Addendum.—The shipping interests of Brooklyn warrant a word regarding the influence of that industry on the occurrence of this disease.

In the first place, the mortality statistics of the town must be somewhat affected by imported cases. In one of our hospitals receiving immigrants, a dozen or more such cases were treated last year, all apparently developing on shipboard.

Then the table above given shows the greatest frequency in the 14th and 16th wards, each on the river front and where living quarters come down close to the water. A comparison shows further that in proportion to the population the wards touching on the East River, Newtown Creek, or Gowanus Canal (*i.e.*, on the commercial waterways of the town), have about twice as many cases as the interior wards not directly on the water. It is not easy to determine whether this might with equal reason be attributed to greater density of population.

In this connection may also be related some experience with an epidemic on the receiving ship at our Navy Yard. For particulars of this I am indebted to the courtesy of Medical Director

A. F. Price, now Surgeon of the Yard. The quotations are from his recent letter: "I have a report (copy) made by my predecessor, Dr. Byrnes, on the old receiving ship Vermont, in July, 1901, from which the following facts are taken and quotations made:

"'A careful investigation of the hygienic surroundings of the vessel (Vermont) was made and the following condition was found to exist: The presence of an unusual number of contagious and infectious diseases among the members of the crew during the past six months, as follows: cerebrospinal meningitis, erysipelas, diphtheria, scarlet fever, small-pox, measles, German measles and mumps. Since March 4, 1901, eight cases of cerebrospinal meningitis occurred. They are traceable to local conditions existing in the ship. Five of the cases died, and one was permanently disabled.

"'The locality from which all the cases occurred is at a point on the berth deck just abaft of the bag-room. Bags and hammocks, the property of the enlisted force of the day, are received at all times and from all parts of the world and are stored in the bag-room without being previously disinfected, or other means taken looking towards freeing the wearing apparel and bedding from contagious and infectious material. The space alluded to on the berth deck is used at night by a number of men who sleep here, and the apparent focus of infection in the cases of cerebrospinal meningitis has been traced with reasonable certainty to this point.'

"The cases are not included in the Brooklyn Health Department statistics."

Dr. Price adds the following: "I think overcrowding and dampness are powerful predisposing causes. In 1872 (about) I was on duty at the Naval Hospital, Philadelphia, and treated a number of cases of this disease sent to the hospital from the receiving ship Potomac. The origin of the disease, as I remember it, was traced to a draft of men who were sent on a large tug from Boston to Philadelphia. They were much crowded on board and the weather being rough and stormy, the men were kept below much of the time. They were transferred to the Potomac, where the disease broke out. Some of the men were transferred to other ships, and were subsequently affected with the disease.

I think we had about ten cases, and one Assistant Surgeon died, who came from the Potomac to the hospital."

These facts indicate that a crowded ship or a region with active shipping interests is specially liable to start the disease.

While, like beri-beri, it often enough occurs inland, still, ships must be suspected of being special distributors of infection. This is in line with much experience showing that from crowding, as in barracks, outbreaks are specially liable to occur.

EDITORIAL

EPIDEMIC CEREBROSPINAL MENINGITIS

It is now almost a hundred years since Danielson and Man, in 1806, first recognized the presence of epidemic cerebrospinal meningitis in this country in the town of Medfield, Mass. This was one year after its supposed discovery in Geneva, Switzerland.

In the early history of this country most of the epidemics occurred in New England, and even at the present time it does not seem that the disease has attracted much attention far inland from the Atlantic seaboard.

A recent recrudescence of epidemic conditions, in New York State at least, has tempted us to publish a number of the more important papers which have appeared, bringing together some of the more striking phases of this present epidemic.

As in many other matters of interest, the State of Massachusetts has led the way in the investigation of this really important disease, the earliest complete description of an epidemic of the disease in this country having been given in 1809 in the report of a special committee appointed by the Massachusetts Medical Society under the secretaryship of James Jackson. More recently (1898), Drs. Councilman, Mallory and Wright's researches have spoken, in their report to the Massachusetts State Board of Health, an authoritative word concerning epidemic cerebrospinal meningitis and its allied forms.

Features of the present epidemic in the greater City of New York are discussed in this issue by Drs. Chapin and Browning, while the more clinical aspects of the affection have been taken up by Dr. Koplik in a masterly and thorough manner. So far as therapeutics is concerned, it is to be regretted that the experiences of Manges with lysol have not been repeated with other observers. While there seems to be little *à priori* reason why subcutaneous injections of any antiseptic could prove of service in this affection, with its very definite pial involvement, yet the therapeutist has so often obtained results, contrary to established theories, that the procedure, as outlined by Manges, might have proved effective.

We cannot but express our opinion that the treatment of this disease still offers little hope. Prophylaxis seems difficult, for we are much in need of enlightenment as to the avenues of ingress of the micro-organisms. Probably the nasal, oral and aural cavities, or the conjunctivæ are susceptible membranes—but we do not yet know. A rigid antisepsis, however, should be enforced in epidemic times.

THE AMERICAN MEDICAL ASSOCIATION

Perhaps the most notable gathering of this Association in its entire history has just convened at Atlantic City. There were nearly 3,000 physicians who registered, an advance of almost 50 per cent. over the largest previous attendance. But it is not entirely from the standpoint of numbers that the meeting offers so much spirit for congratulation. It is because of the scientific and social features, and the earnest spirit of medical organization that is making these meetings, year by year, of increasing moment to the profession at large.

The scientific sessions were well attended. Over 1,500 people heard the papers on appendicitis in the surgical section, and the capacities of the Presbyterian Church were more than exhausted during the discussion on arterio sclerosis before the medical section. Such papers and discussions enlighten the mind and broaden the scientific horizon, while the social ends attained are a breaking down of sectional spirit and a widening of the humanities that cannot but help to elevate the entire profession.

In a future number we hope to be able to give to our readers an abstract of the proceedings of the section on Pediatrics. This section was well attended, there being from 100 to 150 in constant presence, and the program was carried out ably and with celerity. The character of the papers was well above the average, and Chairman Kerley is to be congratulated on the excellent showing of the section.

One item of great importance was taken up by the House of Delegates, a body, by the way, which each year is growing in efficiency and power. We refer to the Medical Council of Education. This council is to consist of five members, and its mission is to investigate the state of medical education in all of the States of the Union; to make suggestions as to the means and methods by which the American Medical Association may best influence favorably medical education, and to act as the agent of the American Medical Association in its efforts to elevate medical education.

Things are being done by the American Medical Association. Organization is the order of the hour and the day. Every competent medical man in the United States should be a member, and a united profession can obtain its will at the hands of State and national legislators for the asking.

ABSTRACTS

Mongolian Imbecility.—G. F. Still in the *King's College Hospital Report,* Vol. VI, reports on this condition. He says:—"In 'Mongolian imbecility' the most striking point is the face. The palpebral fissures slant downward towards the nose as in the Mongolian races. The face is rounded and somewhat 'squat.' The bridge of the nose is flattened and broad—an appearance increased by the marked epicanthic fold usually present. This flattening makes the nose look small and *retroussé.* The cheeks, especially after infancy, are usually high-colored. The tongue is broad, and in the worst cases tends to loll out of the mouth. In infants it often presents no other abnormal appearance, but later it shows a characteristic condition, probably due to hypertrophy of the papillæ. The surface in some cases looks like velvet with very coarse pile; in others it is almost mammillated and divided by branching fissures. The palate is often high and narrow, but sometimes is normal. The head is smaller than normal and brachycephalic. The shape is peculiar; the occipital region tends to be flattened. Strabismus is common and is probably due to errors of refraction, which are common in all forms of idiocy. Nystagmus may occur. Sometimes the ears are abnormally small. The trunk and limbs are well formed. The stature is below the average (by about 4 in. at the age of three) but not to the same extent as in cretins. The hands are short and the relative shortness of the thumb and little finger is very noticeable."

Diphtheria of the Nose.—W. Scheppegrell, New Orleans (*Jour. A. M. A.,* February 13, 1904):—In its characteristics, diphtheria of the nose differs widely from diphtheria of the throat. The constitutional disturbances are frequently so mild that they attract little attention on the part of the patient, and in the majority of cases the physician is appealed to only on account of the continued obstruction of the nostrils or the attending epistaxes. Renal and neurotic disturbances are rare, and paralysis of the velum palati, so frequently found in ordinary diphtheria, is not referred to in the literature on the subject. The absence of these complications is worthy of remark, on account of the greater absorbing capacity of the nasal mucosa as compared with that of the throat. We are all familiar, for instance, with the rapidity with which cocain is absorbed in the nostril and the greater tendency to constitutional disturbances than when this alkaloid is used in the throat. In primary diphtheria of the nose, as in diphtheria of the throat, a fibrous exudate forms on the mucous membrane. This pseudomembrane may be removed, but the attempt is usually followed by bleeding and the membrane reforms. The constitutional disturbances are not marked and resemble the first stage of an ordinary coryza. The main annoyance to the patient is the interference with nasal respiration and the discharge from the nose. Epistaxis is not uncommon and frequently is the first symptom that attracts the attention of the patient or of the parents to the unusual character of the nasal affection. As in diphtheria of the throat, the bacilli are located in the mucous membrane and do not spread through the system. The constitutional disturbance, when present, is due either to the local irritation, the absorption of toxins, or the effects of the interrupted or impeded nasal respiration. The discovery of the Klebs-Loeffler bacillus has been of invaluable assistance in demonstrating that diphtheric rhinitis is the same morbid process as diphtheria of the throat. Every case in which a pseudomembrane is found in the nasal passages and which is not due to the application of the electro-cautery or acids should be examined for the Klebs-Loeffler bacillus.

Metabolic Experiments on the New-born.—A comparison of the results obtained in a careful series of experiments revealed to O. Aronstamm (*Archiv f. Kinderheilk.*, Vol. 37, Nos. 1 and 2) that small infants, for each unit of bodily surface, use up a greater amount of energy than larger infants, which result modifies the law of Rubner that the needs of nutrition are proportional to the absolute extent of surface.

Banti's Disease.—A case of the peculiar symptom-complex known as Banti's disease, developing directly after a severe trauma to the splenic region, is reported by D. Fichtner (*Münch. med. Woch.*, August 11, 1903). The view that the condition is only a manifestation of hereditary, tardy syphilis is gaining more and more ground, though it is often hard to obtain a history of syphilis in the parents and the patients only rarely show other signs. The author's case presented all the typical symptoms and, in addition, went through a facial erysipelas complicated by a suppurative otitis media. Since he did well with arsenic and antiluetic drugs, it was not considered necessary to extirpate the spleen.

LaGrippe in Children.—J. R. Rathmell, in *Southern Medicine and Surgery*, says that in children the course and symptoms of this affection are rarely modified by lesions resulting from previous disease, and it is a great relief to the physician to know that stimulants, narcotics, overwork and dissipation can be, and are, eliminated from the problem. The effect of any poison upon the body of a child will be different from that upon the body of an adult. The undeveloped organs and imperfect tissues will not resist the poison or possibly allow very rapid action, while in the adult the maturity of organs and tissues will give an entirely different manifestation. The difference between the manifestations of this disease in a child and the same in the adult depends upon the anatomic and physiologic constitution, the power of vital resistance and of recuperation. The disease is of a toxic nature and in the immature shows itself in a variety of symptoms, with less of backache, chilly sensations and pain in the limbs, but more of earache with otitis media, purulenta, and a cough very like whooping-cough. It is possible, on account of this great symptomatic variation, to make faulty diagnoses. One author reports twelve autopses as death from pneumonia in children, wherein eight of these clearly showed the Cannon-Pfeiffer bacillus as the main cause of disease which had failed of recognition. The Department of Health of Chicago reported 2,460 examinations of cultures from throats suspected of diphtheria; out of this number 677 showed the Cannon-Pfeiffer bacillus as the only active pathogenic germ, while in 173 of the 677 the diagnosis of diphtheria had been definitely made from the chemical findings, and yet the Krebs-Loeffler bacillus was not found in any of them. Another cloud often resting upon the diagnosis is the appearance on the skin of an eruption very like that of scarlatina. Many writers witness to this, but there is one notable condition wanting, and that is the absence of the throat symptoms.

BOOK REVIEWS

KOMPENDIUM DER KINDERKRANKHEITEN; EIN PRAKTISCHES NACHSCHLAGEBUCH F. STUDIERENDE UND AERZTE. VON PROF. DR. FERDINAND FRÜHWALD, Abteilungsvorstand an der Wiener Poliklinik. Frank Deuticke, Leipzig und Wien.

The author states that it was his intention to produce a book which should present the outlines of the study of pediatrics and serve as an introduction to the larger works. The subject matter is well calculated to fulfil this function and in so far the author has succeeded in his object, but the adoption of the alphabetical arrangement for his topics seems ill advised. For the student it is above all necessary to acquire a good idea of the classification of diseases and of their interrelationships, and once such a broad general view of the subject has been gained as details are learned they fall readily into place and are more easily remembered. The alphabetical catalogue of diseases has no logical basis, however, and for the beginner can be made useful only by pure force of memory, while the scope of the present volume is too limited to permit of the fulness of discussion which justifies this arrangement in encyclopedias.

Aside from this defect the book is interesting and well up-to-date. Many prescriptions are given and symptomatology is very fully discussed; the numerous illustrations also are good and well selected. It must be admitted, however, that in no respect does it surpass the numerous American books of similar nature that have appeared during the last few years.

TRAITE D'HYGIENE ET DE PATHOLOGIE DE NOURRISSON ET DES ENFANTS DU PREMIER AGE. By DR. HENRI DE ROTHSCHILD. Octave Doin, Paris.

This is a monumental work of 750 pages, and is in many respects the most important work of its kind that has recently appeared, Messrs. Rothschild, Perret, Deschamps, Roques, Lanzenberg, Fruhinsholtz, Miele, Kahn, Brunier, Levi and Ehrhardt being the authors of this the first volume projected.

The work is made up largely from the clinic of Dr. Rothschild and discusses all questions of hygiene and nourishment during childhood. The treatise is particularly rich in bibliographical notices and pediatrists reading French will find this a veritable mine of information.

A number of infectious diseases are discussed, particular attention being given to feeding in the therapeutics. Although one might infer from the title that the book dealt more particularly with matters of hygiene, the pathological features are fully covered as well, making the work really a complete reference book of the diseases of children.

PEDIATRICS

Vol. XVI JULY, 1904 No. 7

ORIGINAL ARTICLES

DIPHTHERIA STATISTICS

By Maurice Worcester Turner, M.D., Brookline, Mass.

In the medical journals one frequently sees statements to the effect that the reduction of the mortality in diphtheria, of late years, is more apparent than real, and is not due to the use of the diphtheria antitoxin, but rather to the fact that coincidently with its introducion the bacterio-culture was accepted as the diagnostic test for diphtheria, and as a result, many cases which previously would have been considered as either tonsillitis or some other form of non-diphtheritic sore throat, were, on examination (culture), found to show the presence of the Klebs-Loeffler bacilli.

How much truth is there in this assumption?

Doubtless there are statistical studies bearing upon this subject, but I have not been fortunate enough to find them, and the following analysis is based upon the *Thirty-first Annual Report of the Health Department of the City of Boston for the Year 1902,* particularly on the table to be found on page 13 of that report.

It is as follows, the figures of the population of Boston being obtained at the office of the City Registrar:

TABLE NO. 1.

		DIPHTHERIA AND CROUP		PER
DATE.	POP. BOSTON.	CASES.	DEATHS.	CENT.
1875	341,919	...	...	....
1876	......	...	...	....
1877	......	...	...	....

		DIPHTHERIA AND CROUP		PER
DATE	POP. BOSTON.	CASES.	DEATHS.	CENT.
1878	......	1,370	569	41.53
1879	......	1,167	545	46.70
1880	362,839	1,715	774	45.13
1881	......	1,680	802	47.74
1882	......	1,386	575	41.63
1883	......	1,415	608	42.97
1884	......	1,212	487	40.18
1885	390,393	1,263	450	35.63
1886	......	1,188	423	35.60
1887	......	1,049	410	39.08
1888	......	1,411	589	41.17
1889	......	1,814	683	37.65
1890	448,477	1,475	462	31.32
1891	......	831	285	34.29
1892	......	1,353	481	35.55
1893	......	1,465	546	37.27
1894	......	3,019	878	29.07
1895	496,920	4,059	654	16.11
1896	......	4,489	572	12.74
1897	......	3,398	456	13.42
1898	......	1,661	185	11.14
1899	......	2,836	304	10.72
1900	560,892	4,977	537	10.79
1901	......	3,319	353	10.63
1902	......	1,986	225	11.33

From this table it is evident that the number of cases and deaths from diphtheria bears no relation to the size of the population.

The table is naturally divisible into two parts, as indicated by the black line across it; the upper part, the "preantitoxin" period, including the years from January 1, 1878, to January 1, 1894, at about which year antitoxin and the culture test were introduced; and the second, or "antitoxin period," extending from January 1, 1894, to the end of the table.

The diphtheria antitoxin and the culture test were offered to the medical profession by the city of Boston about October-November, 1894. This does not mean that they were not used before, but simply that their use was restricted on account of expense and lack of availability of both up to that time; of course, since October-November, 1894, liberal use has been made of them.

Whether or not to include the figures for 1894 in the analysis is difficult to decide. Perhaps it is best to both include and exclude them in the figures for each period.

The following table gives, omitting the fractions:

1. The average number of cases yearly during the first period, excluding and including 1894.

2. The average number of cases yearly during the second period, including and excluding 1894.

3. The average number of deaths yearly during the first period, excluding and including 1894.

4. The average number of deaths yearly during the second period, including and excluding 1894.

5. The average percentage of deaths yearly during the first period, excluding and including 1894.

6. The average percentage of deaths yearly during the second period, including and excluding 1894.

TABLE NO. 2.

	CASES		DEATHS			
	YEARLY AVERAGE.		YEARLY AVERAGE.		PERCENTAGE.	
First	Without '94	With '94	Without '94	With '94	Without '94	With '94
Period	1,362	1,342	555	574	40.07	42.80
Second	With '94	Without '94	With '94	Without '94	With '94	Without '94
Period	3,305	3,340	462	410	13.37	12.27

It will be seen that 1894 can be dropped without materially altering the results, so that it need not be a matter of controversy. It certainly does not belong in the first period, and its place in the second is only rendered problematical, because the introduction of the diphtheria antitoxin and the culture test by the city of Boston did not come sharply at the beginning of the year.

Another thing to be remembered about the year 1894 is the claim that it was the beginning of an epidemic of diphtheria. Perhaps it was. The figures for 1893 show but slight increase over those of 1892, while the totals for 1894 are much larger than those for 1893. It is in comparing the yearly totals that the mistake is made.

We must consult the monthly reports and compare them to get nearer the truth. The following table, copied from the monthly reports of the Boston Board of Health, includes not only the year 1894, but two years before and two years after, so we can obtain a better idea of the number of cases and the mortality.

TABLE NO. 3.

		1892	1893	1894	1895	1896
January	Cases	102	152	195	340	501
	Deaths	28	49	61	55	49
February	Cases	108	115	128	294	403
	Deaths	31	32	46	55	47
March	Cases	114	116	185	205	302
	Deaths	35	31	56	29	38
April	Cases	135	73	140	191	304
	Deaths	52	27	42	37	42
May	Cases	107	86	187	221	346
	Deaths	39	33	58	32	46
June	Cases	77	112	167	327	352
	Deaths	23	25	43	43	39
July	Cases	76	89	139	268	300
	Deaths	19	30	41	40	33
August	Cases	78	104	155	274	256
	Deaths	23	28	60	43	27
September	Cases	79	91	250	343	296
	Deaths	31	31	76	51	38
October	Cases	144	196	458	412	461
	Deaths	35	72	109	51	54
November	Cases	185	160	564	630	498
	Deaths	46	58	126	69	60
December	Cases	175	186	469	561	466
	Deaths	52	60	99	83	43
Totals	Cases	1,380	1,480	3,037	4,066	4,485
	Deaths	414	476	817	588	516

It is interesting to note that the totals are not identical with those in the yearly report (Table No. 1), the number of cases being slightly more, while the number of deaths is much less (Table No. 3). If estimated from these figures, the percentage of deaths for these five years would be considerably lower than in Table No. 1. Doubtless there is some satisfactory explanation as to why the footings do not tally; it would be interesting to know.

To return to the question of an epidemic,—there is a curious thing about this monthly table.

The diphtheria antitoxin and the culture test were offered free by the city of Boston to the profession in October-November, 1894, as already stated. Now, on consulting the monthly chart it will be seen that while there were more cases of diphtheria in September, 1894, than in August, yet in October there were nearly twice as many cases as in September, and almost three times as many as in August; and in November the number was still further increased—just at the time that the free culture test was instituted.

Perhaps the epidemic began in September. We shall never know, because there seems to be no definite record as to the number of cultures made before October.

But there is another explanation: perhaps it was a coincidence!

We come now to the question as to whether cases formerly called tonsillitis, etc., are not included under the head of diphtheria. As no report of such cases has ever been required, nothing can be learned by hunting for such statistics. Neither is it necessary, as no one denies that many cases of this kind are now considered to be diphtheria,—"bacteriological diphtheria," if you like—placed in the category as a result of the present diagnostic standard, which ignores altogether, in many instances, the clinical side of the question.

This seems to be the crux of the whole matter. Being *diagnosed* as diphtheria, these cases are given diphtheria antitoxin and get well, *as they always did.*

TABLE NO. 4.

		DIPHTHERIA AND CROUP		PER
DATE.	POP. BOSTON.	CASES.	DEATHS.	CENT.
1875	341,919	...	...	....
1876	......	...	...	....
1877	......	...	...	....
1878	......	1,370	569	41.53
1879	......	1,167	545	46.70
1880	362,839	1,715	774	45.13
1881	......	1,680	802	47.74
1882	......	1,386	575	41.63
1883	......	1,415	608	42.97
1884	......	1,212	487	40.18
1885	390,393	1,263	450	35.63
1886	......	1,188	423	35.60
1887	......	1,049	410	39.08
1888	......	1,411	589	41.17
1889	......	1,814	683	37.65
1890	448,477	1,475	462	31.32
1891	......	831	285	34.29
1892	......	1,353	481	35.55
1893	......	1,465	546	37.27
1894	......	2,195	878	
1895	496,920	1,635	654	
1896	......	1,430	572	
1897	......	1,040	456	Average
1898	......	463	185	40
1899	......	760	304	per cent.
1900	560,892	1,343	537	
1901	......	883	353	
1902	......	563	225	

In this connection it may be of interest to compare with the first table, or yearly report, one in which the latter part, beginning with 1904, is rearranged, the number of cases and the mortality percentage being estimated in the same proportion to the deaths as in the first period.

As already given the average death-rate for the first sixteen years, of the table, is 40 per cent. and it is on this basis that the calculation is made.

The number of cases in Table No. 1 from January 1, 1894, to December 31, 1902, as given, is 29,742; as rearranged in Table No. 4, they number 10,312, a difference of 19,430—65.36 per cent.—nearly two-thirds of the total number, or over 2,000 annually! Is it possible that so many cases are added as a result of the bacteriological diagnosis? *Cui Bono?*

The difference between this table in the number of cases from January 1, 1894, to the end of the column, as compared with Table No. 1 for the same period, is striking. A slight increase in cases in 1894—a mild epidemic—but after that a marked decrease.—*New England Medical Gazette.*

CASE OF PANCREATIC INFANTILISM; RESULTS OF TREATMENT

By Byrom Bramwell, M.D., F.R.C.P.,

PHYSICIAN TO THE ROYAL INFIRMARY, ETC.

At the February meeting of the Medico-Chirurgical Society two years ago (1902) I showed a patient who was suffering from what I believed to be a hitherto undescribed disease, which I have termed pancreatic infantilism. At the March meeting of the Society, in 1904, I again showed the same patient. A remarkable change in his condition has resulted from the administration of pancreatic extract.

Condition before Treatment (December 27, 1901).—When first shown to the Society, in February, 1902, the patient was aged 18 years and nine months, but he did not look more than 11 years of age; his bodily development had apparently been arrested at the age of 11; he was perfectly formed, and presented none of the physical alterations suggestive of sporadic cretinism; mentally he was bright and intelligent. Before the pancreatic treatment was commenced, on December 27, 1901, his height was 4 ft. 4⅛ in., and his weight 4 st. 7½ lbs. For nine years before he came under observation he had suffered from chronic diarrhea; the average number of stools before treatment was five or six in the 24 hours. The abdomen was swollen and tympanitic. The urine was free from sugar.

The pancreatic secretion was shown to be defective or completely absent by three separate methods of research, viz.:

(1) The stools contained a considerable quantity of undigested fat; this undigested fat became very much less after the administration of pancreatic extract.

(2) When the patient was taking a milk diet the amount of phosphoric acid in the urine was greatly below the normal; after the administration of pancreatic extract the amount of phosphoric acid was markedly increased.

My house physician, Dr. David Young, conducted this part of the inquiry. He states that when a patient is having a milk diet, caseinogen is the source of phosphorus in the urine. This caseinogen is broken up in the stomach into paranuclein and a proteid. Paranuclein, which contains 4 per cent. of phosphorus, is insoluble; but when paranuclein comes in contact with the pancreatic juice it is split into paranucleic acid and an albumose, which is soluble. This is the source of the phosphorus (phosphoric acid) in the urine.

Dr. Young found that the amount of phosphoric acid in the urine in this case, when the patient was taking a milk diet, was extremely small; but that during the administration of the pancreatic extract the amount of phosphoric acid in the urine underwent a very marked and rapid increase.

(3) By Professor Sahli's test.

This test consists in the administration of capsules (invented by Professor Sahli, of Berne) containing iodoform surrounded by a glutoid substance, which is insoluble in the gastric and intestinal secretions, but which is soluble in the pancreatic secretion. If the pancreatic secretion is active, the glutoid wall of the capsule is dissolved and the iodoform is set free; iodine, in the form of iodides and iodates, can then be demonstrated in the saliva by testing with chloroform and nitric acid; the nitric acid sets free the iodine, which gives a pink color to the chloroform. The test is a beautiful means of demonstrating, firstly, the length of time that food (*i.e.,* the capsule) remains in the stomach, and, secondly, whether the pancreatic secretion is active or not. If no iodine reaction is obtained in the saliva after the administration of the capsule, it may be concluded either that the capsule has not passed from the stomach, or that the pancreatic secretion is in abeyance.

In this case, after the administration of a test capsule, iodine could not be detected in the saliva. That the capsule had passed from the stomach was, however, proved by the fact that it was found undigested in the stools. This experiment was repeated more than once, and the activity of the capsules was tested by a control experiment. Capsules were given to two patients who had no stomachic or intestinal disease in both cases, iodine was detected in the saliva an hour and a half after the capsules were swallowed. When, however, a test capsule was given along with food, and a dose (2 drachms) of pancreatic extract was given two hours afterward, it was found that the saliva contained iodine an hour after the pancreatic extract had been administered.

These three methods of investigation showed that the pancreatic secretion was deficient or entirely absent. It seemed probable, therefore, that the defective metabolism in the upper part of the gastro-intestinal tract, the diarrhea, and the arrested development (the infantilism) were due to defective or arrested pancreatic secretion. The results of treatment—the administration of a glycerine extract of pancreas—have confirmed this view.

Condition after Treatment (March, 1904).—The pancreatic treatment was commenced on December 27, 1901, and has been continued more or less regularly since that date. The result has been remarkable improvement both as regards the diarrhea and the bodily development and growth. (1) Before the treatment there were on an average five or six loose motions daily; now there are on an average two motions daily, one of which is formed. (2) Before the treatment the patient states that he had not grown at all for eight years; during the two years that have elapsed since the treatment was commenced, he has grown 5⅜ inches and has increased 1 st. 8 lbs. in weight. (3) The sexual development, which when the patient came under observation was quite infantile, is now progressing in a normal manner; there has been a growth of pubic hair, and the penis and testicles have developed. (4) The patient looks much older, and his voice, which was high-pitched and childish, has become low-toned and rough.

Remarks.—I am of opinion that this case is a distinct type of infantilism due to defective or abolished pancreatic secretion. This opinion is, I think, proved by the observations on the pancreatic secretion made before the treatment was commenced, and by the extraordinary improvement which has resulted from the administration of a glycerine extract of pancreas. I believe the condition to be a distinct clinical entity—a new disease which has not hitherto been recognized; and what is of even more importance, the results of the treatment seem to show the manner in which the disease should be treated and by which it can be cured. As I have already stated, the condition is quite distinct from sporadic cretinism, with which many of these cases have no doubt been confounded. The patient presented none of the physical or mental characteristics of sporadic cretinism—the infantile form of myxœdema. Skiagraphs were taken when the patient first came under observation; they showed that the epiphyseal lines—which should close between the 16th and 18th years (Gray)—were then, at the age of 18 years and nine months, unclosed, consequently that the bones were capable of further growth.

The following table shows the results of the treatment:

TABLE SHOWING THE AGE, HEIGHT, WEIGHT, ETC., IN THE CASE OF PANCREATIC INFANTILISM DESCRIBED IN THE TEXT, AT DIFFERENT DATES BEFORE AND AFTER TREATMENT.

Date.	Age.	Height.	Increase in Height.	Weight.	Increase in Weight.	Sexual Development.	No. of Motions per Diem.
Dec. 27, 1901*	18 9/12	4 ft. 4⅛ ins.	—	4 st. 7½ lbs.	—	Infantile	4, 5, or 6*
Feb. 2, 1902	18 10/12	4 ,, 4 ,,	½ in.	5 ,, ½ ,,	7 lbs.	,,	2 or 3
Oct 22, 1902†	19 7/12	4 ,, 6 ,,	1⅞ ,,	5 ,, 2 ,,	8½ ,,	,,	3, 4, or 5†
May 20, 1903	20	4 ,, 8½ ,,	4⅜ ,,	5 ,, 7 ,,	13½ ,,	Commencing	2 (1 formed)
Mar 2, 1004	20 11/12	4 ,, 9½ ,,	5⅜ ,,	6 ,, 1½ ,,	22 ,,	Considerably developed	2 (1 formed)

* Treatment commenced at this date.

† For the past two months has omitted to take the pancreatic extract.

IS EPILEPSY INCREASING? IF SO, WHY?*

By J. M. Aikin, M.D., Omaha, Neb.

Is epilepsy increasing? is an interrogatory incapable of decision by a dogmatic affirmation of negation.

Definite clinical symptoms of epilepsy were recorded nearly twenty centuries since, but I doubt if there is one other disease with symptomatology well known that is so void of records either for or against its comparative ratio to the population. The absence of statistics is doubtless due to the pessimistic view concerning its curability that is so largely entertained by the profession. Not until within the last fifteen or twenty years has the amelioration of epilepsy been deemed a possibility. It is scarce a dozen years since any commonwealth in the United States—yes, in the world—has accepted the responsibility of caring for this class of dependent fellow citizens.

To assert that epilepsy is increasing because certain States have made provision for their epileptics, and other commonwealths are urgently recommending the building and occupancy of institutions exclusively devoted to the care of this class of cases, would be a futile argument. The fact that many of the learned men in science and.medicine are in recent years searching along new lines of investigation for the pathogenesis of epilepsy is authentic evidence that the disease is not declining. Statistics on the ratio of epilepsy to the population now as compared to its relation ten, twenty, fifty or a hundred years since are nowhere recorded. But few authorities hazard an opinion on that question. Where an expression is given by competent observers the preponderance of evidence is on the side of an increasing frequency of the disease. In no other country in the world has the course of epilepsy been so systematically observed in its genealogy as in America. It is our American authors who, when confronted by facts, accept the conditions, waiving all adverse opinions based on

Dr. Brower, of Chicago, says: "My opinion, based on my own clientage, is that epilepsy is increasing. I also have the emphatic opinion that there is a close relationship between alcoholism on the parent and epilepsy in the offspring."

Jelliffe, of New York, says: "My opinion is that epilepsy is slightly decreasing. This is, I believe, largely due to the fact that increased obstetric care and increased education along obstetric lines is teaching the practitioner how to deliver women better, and we are getting fewer crushed heads and brain injuries, in 70 to 80 per cent. of which epilepsy is apt to develop."

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* Read before the Nebraska State Medical Association, Omaha, Neb., May 3 to 5, 1904.

Dr. Johnson, superintendent of the Institution for Feeble-Minded Youth in Nebraska, says: "It is my opinion that epilepsy is increasing in Nebraska faster than the increase of our population. I believe that injuries and infectious diseases are more potent causes in producing epilepsy than alcohol. I also believe that the abuse or even moderate use of alcohol in the parent lays the foundation for unstable nervous system in the child."

Dr. Crothers says: "One reason for supposing that epilepsy and inebriety are the same is their resemblance, particularly the paroxysmal form of inebriety, which is increasing, and in a large proportion of cases is attended with epileptic convulsions. I feel certain that the children of parents suffering from this form of disorder are far more likely to have epilepsy than other diseases. From statistics of twenty-five cases of epilepsy, eighteen gave a history of using alcohol either moderately of excessively. I should place the alcoholic origin of epilepsy at from 20 to 40 per cent. It is certain that the alcoholic origin of epilepsy is becoming more and more apparent every year."

Gowers says: "Epilepsy is occasionally an effect of alcoholic excess, but the attacks seldom occur periodically, as they do in the ordinary form of the disease."

The astute German authority, Hiot, says: "There is no doubt but that hereditary neuropathic tendencies increase the susceptibility to nervous diseases in general, and certainly to epilepsy; but this heredity alone does not suffice to make of an otherwise healthy individual an epileptic. For this, some additional cause is needed."

Oppenheim says: "Poisons may, and do, directly produce epilepsy. Chronic alcoholism and chronic lead poisoning may lay the foundation for epilepsy in the descendants. Acquired alcoholics not rarely become epileptics. Of the acute infectious diseases scarlet fever, above all others, has been definitely proven as sustaining a direct relationship to epilepsy."

While heredity is an important factor as a causation of epilepsy, it is more often by transformation from other neuropsychic disorders. Hereditary considerations are the usual evidence of degeneracy, and the common onset of the disease at the developmental epochs, corroborate the existence of a vicious organization unable to weather the storms incident to ordinary life, plus nature's demands of growth. Of the toxic agents, in the order of their frequency as exciting causes, Drs. Archibald Church, Frederick Peterson, C. S. Potts, D. R. Brower, T. D. Crothers and Wm. Spratling give alcohol first place. Dana places the infectious diseases, especially scarlet fever, as taking precedence of all the proximate causes of epileptic convulsions. Peterson assigns heredity as a cause of epilepsy in 33 per cent. of the cases. He says: "Not only may alcohol itself give rise to what is known as alcoholic epilepsy in an inebriate, but it is more potent still as a factor in the causation of epilepsy through alcoholic hereditary degeneration." Thus alcoholism in parents is prone to induce epilepsy and other evidence of nervous instability in the children. In our studies of the proximate effects of alcohol on the drinker we must not forget that neurotic degenerates present little resistance against the effects of alcohol. In many cases that we call alcoholic epilepsy, the tendency to epilepsy or other neuroses existed previously by heredity, in which cases the alcohol is simply an exciting agent or a contributing cause. Apropos to reflex causes of epilepsy he says: "Among several thousand cases observed by me, I have never yet met with a case of epilepsy due to a reflex factor, although I have made the following distribution of inherited causes:

Spratling, after examining 1,070 epileptics in the Craig Colony, makes the following distribution of *inherited* causes:

	Per cent.		Per cent.
Epilepsy	16	Tuberculosis	14
Alcohol	15	Unknown	4
Insanity	8	None	41

HOW HEREDITY ACTS.

First taking up epilepsy in the parent as a cause of this disease in the child, we found that out of 1,070 cases it was transmitted to 15 per cent. of the males, and 17 per cent. of the females, or 16 per cent. all told. Alcoholism was the family cause in the same 1,070 cases in 16 per cent. of the males and 12 per cent. of the females, or 14 per cent. all told.

Insanity in the parent caused epilepsy in 7 per cent. of the males and 10 per cent. of the females. It seems clear that more males develop epilepsy as a result of alcoholism in the parent than do females, while more females develop it as a result of insanity in the parent than do males. Tuberculosis was definitely established as the family cause in 15 per cent. of the males and 12 per cent. of the females; collectively, we found either epilepsy, alcoholism, insanity, or tuberculosis, and in some cases two or more of all these to be hereditary factors in 56 per cent. of the 1,070 cases, leaving 44 per cent. due to other causes.

Dr. Paul Kovalevsky, of St. Peterburg, in his report before the National Association for the Study of Epilepsy, says: "The highest per cent. of epileptics to the population of all Russia is found in Caucasus, that part of Russia where vineyards and wine-making most abound. The drinking water from the mountain rivers is bad, but the wine is good. The nations quench their thirst, not with water, but with wine, and the wine contains 5 to 15 per cent. alcohol. Wine-drinking is so common in Caucasus that no one considers it inebriety. Everybody knows what a high percentage of epilepsy is caused by the use of alcoholic beverages."

In an analysis of 68,040 epileptics in America and Europe, covering the period from 1854 to date, Dr. Spratling finds the ratio of male to female epileptics is as 5 to 4. Up to the twentieth year of age, the ratio between the sexes is equal. His reason for why there is a 20 per cent. higher ratio among the males after the twentieth year in life is assigned to alcohol, trauma and syphilis. Convulsive phenomena are seen at least in 50 per cent. of the persons on police records in that large class of arrests for drunkenness and disorderly conduct. Epileptoid convulsions are due to a great variety of toxines, but the increasing frequency of convulsive conditions in alcoholic users is evidence that the special toxine is alcohol. Crothers says: "Convulsions of a uniform type following the long-continued use of alcohol are called epiletoid."

It is not clear whether this uniformity of type in appearances is due altogether to the action of alcohol, for the reason that the use of alcohol is in many cases a symptom, and not a direct cause. As in other psychoses and neuroses, the dividing lines between the use of alcohol as a symptom or an active cause cannot be easily traced. We have seen from Spratling's analysis of 1,070 epileptics that a similar heredity developed in 16 per cent., and of the dissimilar cases 15 per cent. were epileptics with alcoholic parentage, while 14 per cent. came of tubercular parents, and in only 8 per cent. was insanity a parental precedent. In the Johns Hopkins Hospital Reports, vol. 6, 1897, Berkley found that poisoning with alcohol in considerable doses continued over a moderate time will produce decided and ascertainable lesions of the nutrient structures and nervous elements of the cerebrum, very similar in character to the pathalogic lesions produced by other more virulent soluble poisons. The terminal twigs of the dentrites were also found to have become varicose or beaded, the gemmules being very scarce or absent.

No fact is more firmly established than that alcoholic ancestors will transmit to their descendants a defective brain and nerve power. The form and shape of this defect and its manifestations will vary widely. It is a clinical fact that alcohol seems, of all drugs, the most potent to impress cell growth and function. I believe the one cause above all others in producing the convulsions by which we name the disease is auto-intoxication, but there must be a defective nervous organization behind it. There are many cases of epilepsy in which there is no history, direct or indirect, of alcoholism, and there are thousands descended from alcoholic parentage, or who have acuired alcoholic habits, who do not have epilepsy. They are, however, lessening their vital powers for resistance against toxines, and offering a poor foundation for healthy offspring. The undisputed supremacy of alcohol in particular fields, may easily lead us to overestimate its influence in others. I believe, as we all do—if we will answer truthfully to our own conscience—that the use of alcohol tends to nervous disorders.. I believe that a better knowledge of how to care for parturient women, scarlet fever cases, and many other infectious diseases, is lessening the increase of epilepsy from these sources, while epilepsy from toxic elements, as such, when taken into the system, is developing new cases in excess of those prevented by the more rational treatment where poisons are generated within the body.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE

Section on Pediatrics

Stated Meeting, January 14, 1904.

DR. DAVID BOVAIRD, JR., *Chairman.*

A CASE OF DIABETES INSIPIDUS IN A CHILD OF NINE AND A HALF YEARS.—Dr. E. H. M. Sill reported this case. The patient was a boy of Austrian parentage, and his family history was negative. He had been well up to eighteen months previously, when he was observed to be excessively thirsty and passing large quantities of pale urine. There were pains in the lumbar region, he was irritable and easily fatigued. The mouth was dry and there was but little sweating. The daily quantity of urine had varied from five to twelve quarts. On examination of the urine it was found to contain neither albumen nor sugar, but the specific gravity was 1,005.

Dr. Sill said that this was a very rare affection in children. Of one series of 35 cases, 21 occurred under the age of ten years, and 9 under five years of age. This disorder was most apt to make its appearance after fright, sunstroke and injuries to some portion of the cerebrospinal axis. The duration was indefinite. Out of 77 cases reported by Roberts, 16 recovered completely, 47 were improved and 14 died. Ergot, valerian and electricity were considered useful in the treatment.

Dr. Sara Welt-Kakels reported 2 cases in children that she had observed. One was a girl of nine and a half years, in whom the disease had existed three years at the time of coming under observation. The skin was dry, the appetite poor, and her condition had been made temporarily worse by foolishly restricting the quantity of water taken. The specific gravity of the urine varied between 1,000 and 1,003, and the quantity of urea was 0.1 per cent. During the ten months the girl was under treatment she gained about eight pounds. It was subsequently learned that the child developed an oculomotor paresis and had finally died after a few days' illness. The best results in the treatment of this case were secured by the administration of antipyrin.

The other case occurred in six-year-old boy. There were no symptoms except the great thirst and the polyuria. He was passing 10 to 12 quarts of urine in the 24 hours, or about two-thirds his body weight. This quantity of urine was somewhat diminished by the use of antipyrin. The urine was faintly acid, almost colorless, and was sugar-free, as proved by a number of tests. The quantity of urea was about 8 grams above the normal.

Dr. James J. Walsh said that he had met with this affection in a girl of sixteen months. It began after a fall out of bed. From 4 to 6 quarts of urine were passed daily, having a specific gravity of 1,003. The child had had the disease about three years.

Dr. C. Herrman remarked that in one case of diabetes insipidus he had obtained good results from the use of suprarenal extract.

THE SYMPTOMATOLOGY, DIFFERENTIAL DIAGNOSIS AND DIAGNOSIS OF BRONCHOPNEUMONIA IN CHILDREN.—Dr. Matthias Nicoll, Jr., read this paper. He said that bronchopneumonia was essentially a disease of the poor, and must be largely studied in institution practice. This paper was based on an analysis of 167 cases of so-called primary bronchopneumonia occurring in the New York Foundling Hospital in the past three years. It was sometimes said that about one-third of the cases of bronchopneumonia were primary, but this was too large a percentage, according to the experience in most institutions. About two-thirds of the cases of bronchopneumonia occurred between December and May. Of 147 cases in which the age was known, 70 per cent. were in children under two years of age. Anything which tended to lower the powers of resistance might act as a direct cause of the disease. It was most uncertain in its course and termination.

The onset was abrupt, and was often characterized by irritability or apathy, vomiting and a hot skin. The cry was apt to be short, terminating abruptly as if causing pain. The temperature would rise four or five degrees, and the respiration become forty or more a minute. A significant sign was the change in the pulse respiration ratio, this being three to one, or, perhaps, even two to one. There was usually a difference in the intensity of the cry as heard on the two sides of the chest. Subcrepitant and fine râles should be carefully sought for, because, along with the symptoms already detailed, they are proof of pulmonary congestion. When there was much consolidation, one would hear over these areas bronchovesicular or bronchial breathing. It was not uncommon to note the physical signs of a bronchopneumonia only just before the occurrence of defervescence. The mild cases usually lasted a fortnight, but often the disease lasted one or two months. In the favorable cases, one would usually note a tendency, after the first two or three days, for the temperature to become less, but termination by crisis was exceptional. This mode of termination occurred only nine times in the author's 167 cases.

While the cough was often troublesome, it was by no means rare for the cough to be entirely absent. Suppression of the cough was seen in the fatal cases. There was apt to be more or less intestinal disturbance, and gaseous distention to such a degree as seriously to embarrass respiration. If, in a child under three years of age, sudden and grave illness developed, or if in the course of some other disease there was a sudden increase in the temperature and respiration, bronchopneumonia should always be thought of. The change in the pulse-respiration ratio was of much diagnostic importance. It was true that during the height of the fever of measles there was a similar disturbance of the pulse-respiration ratio, but this was only temporary. The author did not believe it was possible to distinguish, clinically between disseminated bronchopneumonia and capillary bronchitis. The detection of the occurrence of bronchopneumonia in the course of a laryngeal diphtheria was sometimes difficult owing to the transmission of sounds from the trachea. When bronchopneumonia was associated with marked nervous phenomena at the onset, the disease might be confounded with meningitis. Rigidity of the neck might be present, and the apathetic expression reminded one of the mask-like face of meningitis.

THE TREATMENT OF BRONCHOPNEUMONIA IN CHILDREN—Dr. William P. Northup read this paper. He thought it was of advantage, in connection with the subject of treatment, to bear in mind that, in bronchopneumonia, the pulmonary apparatus was the seat of a pathological process that might well be likened to a pulmonary erysipelas or cellulitis. In the treatment of bronchopneumonia it was most important to secure the free admission of fresh air. He did not hesitate to let the temperature of the sick room go down to 65° or even 40° F., and it was a common experience for his nurses to be compelled, while on duty, to wear wraps and gloves to keep themselves warm. He had no fear of a fever patient "catching cold"—indeed, no one "caught cold" from fresh air entering the nostrils or striking the oval of the face. This free admission of air was not only refreshing to the patient, but favored elimination. It was of the utmost importance that perfect tranquillity be secured for the pneumonia patient. At the outset of the treatment, the bowels should be freely opened with castor oil, with or without calomel.

The diet should be carefully regulated so that fermentation and consequent gaseous distention does not occur. Should this condition occur, it should be relieved by high saline irrigations of the colon. The indications of the thermometer should not be taken too seriously; it was far better to be guided by good judgment and the patient's appearance. An important part of the nurse's duty was to keep the feet warm and note the respirations. If the feet were cold and the pulse poor, a hot foot-bath, given in bed, would prove an excellent stimulant to the heart. The use of heavy poultices was to be deprecated. He did not approve of steam tents in pneumonia, for they robbed the patient of oxygen and macerated him.

Dr. L. Emmett Holt opened the discussion. He said that perhaps in no other disease was the hygienic treatment so important as in pneumonia. While he would admit that a great many cases of bronchopneumonia could be successfully treated by the cold-air method so ardently advocated by Dr. Northrup, he thought it would be a mistake to let the impression go out that every case of bronchopneumonia could be appropriately treated in that manner. He was a firm believer in the efficacy of steam in many serious cases of infantile bronchopneumonia. Where there were dry, wheezing râles all over the chest and scanty secretion, and where the child was panting for breath, both counter-irritation and steam would give relief.

He considered it very unfortunate that so many of our statistics regarding pneumonia and other diseases were drawn from hospital rather than from private practice, for the deductions from such statistics gave the novitiate in medicine some very erroneous notions. In order to contribute his mite to the statistics derived from private sources, he had looked over the records of primary pneumonia cases seen in his private practice in the last three years. In this way he had collected 119 cases, 92 of which had been seen in consultation, thus indicating that a fair proportion of the cases were severe. He agreed with Dr. Nicoll that lobar pneumonia was particularly common in private practice. In his series there were 70 lobar pneumonias, of which 61 recovered. As 21 of these patients were under two years old, it proved that one was not justified in considering all cases of pneumonia occurring in children under three years of age as examples of bronchopneumonia. There were 48 cases of bronchopneumonia, of which 41 recovered. In this series, 21 were under a year old, and all of the fatalities occurred in the first year. Thirty-five of the 41 cases were so severe that they were seen in consultation.

Dr. Holt said that these figures should teach the lesson that there is in bronchopneumonia a strong tendency to recovery, from which it logically followed that one should be chary about too sweeping deductions, based on individual methods of treatment. He knew of nothing more detrimental to the pneumonia patient than bad feeding; except, of course, the exclusion of fresh air. The deaths occurring early in children suffering from bronchopneumonia were generally the result of an overpowering intoxication or an overwhelming by a large area of lung involved. The later deaths, those occurring in the third of fourth week, were the result of exhaustion due to malnutrition. After the first week or ten days the case became one of careful feeding. Physicians often did not realize how much harm was done sick children by disturbing them too much.

Dr. Floyd M. Crandall said that if there was one thing that the medical profession needed to be taught at the present time, it was not to be too strenuous in the treatment of pneumonia. The tendency was to give children too much medicine and do too much for them. When the bronchial secretions were scanty, it might be necessary to prescribe some chlorid of amonium, and if so, it should be given in water and not in syrup, but cough medicines were much more often prescribed than needed. The physician often forgot so to arrange the medicines and other therapeutic measures that they would disturb the child very little at night. Physicians who had chiefly observed pneumonia in hospitals were apt to be surprised when they saw in private practice the strong tendency to recovery.

THE DETERMINING FACTOR IN LOBAR AND BRONCHOPNEUMONIA—Dr. Augustus Wadsworth described some experiments that he had been conducting upon animals. Animals were inoculated with pneumonia exudates of varying degrees of virulence. In most instances in which the animals were normal, the virulent exudates caused a bacteriemic type of infection without much lesion in the lung. When less virulent matter was used, no lesions appeared in the lung. Other animals were subsequently subjected to trauma, to cold, and to the injection of irritating substances. In these animals pulmonary lesions were more commonly met with, and were usually of the bronchopneumonic type; if, however, very virulent cultures were used, the bacteriemic type of infection, without lung lesion, was more apt to result. Lobar lesions developed chiefly in animals showing greater powers of resistance—indeed, it was only possible to produce a lobar pneumonia in the animal by a careful balancing of the virulence of the infection and the susceptibility of the animal. Animals were then immunized by injecting low-virulence and high-virulence micrococci. When the animal was protected he obtained a lobar type of lesion with the high-virulent micrococci. If the resistance was not sufficient to prevent the production of the bacteriemic type of infection, the lesions were generally of the bronchopneumonic type. The lobar pneumonia developing in a resistant and immunized animal was comparable with the lobar pneumonia developing in a robust adult. The gravity of a pneumonia really depended more upon the likelihood of a general infection than upon the extent of the lung lesion, for the latter was, after all, a conservative process.

Dr. S. A. Knopf said that from his experience with the fresh-air treatment of a chronic disease, like pulmonary tuberculosis, he felt disposed to warn against the too sudden employment of such treatment. Nothing had been said in the discussion concerning the use of dry cups. This was an old-fashioned mode of treatment, but withal an excellent one. He was strongly in favor of anticipating the occurrence of heart failure in pneumonia by giving digitalis from the onset of the disease.

Dr. Anthony Bassler said that he had seen certain cases which were not ordinary bronchitis, and yet he hardly liked to classify as bronchopneumonia; he would urge the retention of the old term, capillary bronchitis. In his private practice he had not observed such a large proportion of lobar pneumonia in young infants.

Dr. C. G. Kerley insisted that there was no such thing as a mild or trifling bronchitis in a young infant; it was always a dangerous infection in such a subject. Our object in the treatment of bronchopneumonia should be to increase the patient's powers of resistance. It was his practice to reduce the quantity of food taken to one-third what it had been before the onset of the pneumonia. He made it a point to secure good ventilation of the sick room, but he did not go to the extreme of reducing the room temperature to 40° F. He had observed 30 cases of pneumonia in infants that had been treated as out-patients, with only one death, and that in a child suffering from marasmus. The parents were not told that the babies had pneumonia, but were instructed to bring the little ones to the dispensary daily for observation. The results were certainly better than were obtained among the same people in their tenement homes. Steam inhalations were undoubtedly beneficial in some cases of bronchopneumonia, and the expression "steam tent" did not necessarily imply that the tent was closed up and the little sufferer so deprived of much-needed oxygen. Where there were spasm and respiratory distress these would be aggravated by exposure to cold air; on the other hand, these were just the cases that were promptly relieved and benefited by steam inhalations.

Dr. Walter Lester Carr also spoke of the benefit to be derived from steam inhalations in cases of infantile bronchitis and bronchopneumonia with respiratory spasm. Where the bronchopneumonia showed a tendency to spread, he favored counter-irritation by means of a mixture of one part mustard and six or eight parts of flour. Where the secretions were very free, but not expectorated, some relief was afforded by elevating the foot of the bed.

Dr. Nicoll, in closing, said that a case of disseminated bronchitis involving the finer bronchi was, to all intents and purposes, a bronchopneumonia, and should be considered as such.

NEW YORK ACADEMY OF MEDICINE

Section on Orthopedics

Stated Meeting, held March 3, 1904.

VIRGIL P. GIBNEY, M.D., VICE-PRESIDENT, IN THE CHAIR.

A CONSIDERATION OF THE ULTIMATE RESULTS OF THE BLOODLESS REPLACEMENTS OF CONGENITALLY DISLOCATED HIPS.—Dr. John Ridlon, of Chicago, read this paper, and said that in selecting his subject he had been actuated by divers motives, but chiefly with the hope that a straightforward presentation of the facts, in so far as he had been able to obtain them, might correct certain delusions and false impressions that had crept into the minds of medical men and others, mainly through uninformed writers of sensational articles in the newspapers. He said that for the past five years no subject had been so persistently misrepresented by the lay press and, he regretted to say, by the writers of the medical press, and nothing had been more misunderstood in that time than the results of these bloodless operations. He believed that enough hips had been operated upon and sufficient time had elapsed to gain an accurate knowledge of the facts which he wished to present. In bilateral congenital dislocations of the hip he believed this operation to be the only one to be used in every case, and he did not think that the bloodless replacement of these hips should be condemned if the anatomical replacements did not meet with more than 10 per cent. or 20 per cent. of successes. It was regrettable that people expected to get perfect results from this operation, but he thought the operators would be encouraged by the results thus far obtained in selected cases. The development of the operation was so well known to the profession that he did not think it necessary to go into its consideration. He divided his cases into four groups, as follows:

(1) From February 28, 1894, to July, 1897, these cases being observed by him in Chicago. In this group there were 12 patients, all girls, whose ages varied from fifteen months to eleven years. Five dislocations were on the right and seven on the left side, and the shortening varied from one-half to two and a half inches. Only two of these could be traced.

(2) From July, 1897, to the advent of Professor Lorenz. In this group there were 40 patients with 51 dislocated hips. At this point the speaker took up the consideration of what constituted a good result. Professor Lorenz, he said, considered shortening of the hamstring muscles as indicative of replacement, but Dr. Wilson, of Philadelphia, had demonstrated that this was not

always true. The accidents which happened in the efforts at replacement were paralysis, fracture of the neck of the femur, fracture of the shaft of the femur, tear of the perineum, rupture of femoral artery, gangrene, etc. Of these 51 dislocated hips in this second group, 20 were on the right and 31 on the left side. Thirty-six were girls and 4 were boys. The ages varied from eighteen months to thirteen years, and the shortening varied from one-half to four and a half inches. Of the 51 hips, 24 were operated upon, and among these 5 were failures and 5 relapsed. All were cases of dorsal dislocation, except one, which was upward and forward. He then detailed some cases which presented points of interest.

(3) Those that were examined and operated on by Professor Lorenz. Among this group there were 22 patients with 26 dislocated hips. Three were boys and 19 were girls. The ages varied from two to twelve years, and the shortening was from three-quarters to two inches. The results of operations on these 26 hips were, 12 anterior transpositions, 4 supracondyloid, 7 failures, 1 apparent, and 2 true replacement. In one there was a torn perineum, in another paralysis, one fracture of the neck, and one fracture of the shaft of the femur. He said that allowances should be made for Professor Lorenz' failures, because, after the operations, these little patients were no longer under his care.

(4) This group comprised those that had been cared for by him since October 12, 1892. There were 42 patients, of whom 24 were girls and 18 boys. In 24 the dislocation was on the right side. The ages varied from seventeen months to thirteen years. The shortening was from one-half to three and a half inches. Of the 52 dislocated hips there were the following results: 7 anterior transpositions, 4 supracondyloid, 5 failures, 4 apparent replacements, 6 perfect replacements, 2 rejected, 4 refused operations, 6 still waiting for operation, 14 apparently in place at time of operation, but still in plaster splints. Fracture of the neck of the femur occurred in two cases.

Much interest was taken in the report of Case No. 33, which was given as follows: "On December 30, 1900, the right hip relapsed during the second month, while in the plaster splint, and the treatment of this hip was abandoned until a good result should be had on the left side. The plaster splint was removed from the left hip at the end of seven months, and the replacement was almost perfect. During the following three months the femoral head was forward, but not enough to be felt in the groin. Dr. Fenger was of the opinion that there was an anterior transposition, and as such I have reported it. The child walked on the limb for 18 months without any striking result, and when Professor Lorenz operated on the right hip on October 13, 1902, he examined the left hip and said: 'That hip is good enough for any one.' He did not say whether he considered it a perfect replacement or an anterior transposition. When Lorenz removed the splint from the hip he had operated on, the limb was found to be much shorter than the one I had operated on, but the head appeared to be in place. After three weeks of daily massage and manipulation, an anesthetic was administered and the leg again stretched and manipulated and again placed in a plaster splint." Dr. Ridlon believed that this patient could now walk, but that a decade would elapse before it would be known whether or not there was a perfect result.

In speaking of the attitude of medical men toward bloodless surgery, he divided their interests into four phases: First, indifference; second, interest; third, delirium; fourth, the morning-after when things look different.

Notes had been taken of 129 patients with 158 dislocated hips. Of these 158, 93 were operated on and only 10 could be called perfect anatomical replacements. How many of 14 that are apparently in place, but which have not been X-rayed, that will prove to be permanent six months later was a matter of opinion. Some would likely show improvement. None of the dislocations originally dorsal had been demonstrated to have relapsed where the adductor muscles had been torn. Of the 93 there were 61 anterior replacements, 10 perfect replacements, 17 failures to replace, and 5 relapses. Of the 5 relapses, Dr. Lorenz operated on 2 and Dr. Ridlon on 3. When anterior transposition occurred, he believed it was due to freely tearing the tissue in front of the joint. When the supracondyloid occurred, he believed it was due to the saucer-shaped acetabulum. When the adductor muscles were not freely torn and the tissues were not overstretched, relapses into dorsal positions might occur. It was his experience that if the femoral head was not buried in the acetabulum it was doubtful if one would get an anterior transposition. Anterior transpositions frequently followed too violent operative measures. Retraction of the posterior muscles of the hip during the period of retention would cause an outward rotation of the limb which often would be found impossible to correct.

From his study of this bloodless operation it was his belief that in 100 cases 10 per cent. would become permanently cured, 60 per cent. would be only partially successful, and 30 per cent. would be failures. He reported a great many interesting cases showing skiagraphs and commented freely upon all.

Dr. Wilson, of Philadelphia, said that before the period of delirium referred to by Dr. Ridlon, he dreaded those cases of congenital dislocations of the hip because nothing but disaster resulted, such as death, suppuration, ankylosis, etc., and he was not encouraged to pursue the subject; but all this was before the advent of Lorenz. Since his visit he saw the advantage of the operation, and his own errors had been pointed out to him. In the Philadelphia clinic 20 cases were selected and presented to Lorenz for operation, and he selected a sufficient number to demonstrate his method. Among the 9 cases he operated upon he had the following results: In 3 there was a perfect anatomical replacement with good functional results; in 3 there were fairly good functional results; in 1 it was not reduced, and in 2 it slipped after reduction. He was surprised at the expressed opinions regarding the value of the radiograph in these cases of congenitally displaced hips, for he believed they were of great value when considered in connection with the clinical phenomena. He recalled the case of a boy four years old, whom Lorenz had failed to cure. The operating was an absolute failure, in that the Professor had exhausted his immense strength in the vain effort to start the muscles and set the hip. He said that Lorenz had been of great assistance in promoting bloodless surgery, but he personally knew of but three perfect results.

Dr. Bradford, of Boston, said that congenital dislocations of the hip that had been observed in Boston had been carefully considered, and 130 cases had been reported and submitted to the public, and soon he hoped to have a statement prepared to present to the profession which would be entirely free from bias. This question, he believed, should be looked at without any so-called delirium. From a surgical standpoint there were certain facts that were not thoroughly understood. Now that we understood more regarding the pathological anatomy, an effort should be made to cure these patients, since the possibility of obtaining perfect results had been demonstrated. He believed that perfect anatomical cures should be strived for and could be obtained in a certain percentage of the cases. Taking the statistics as presented in Boston during the past twenty years, he said it would be found that the number of anatomical cures were steadily increasing, and by cure he did not mean functional cure or transposition, but a replacement of the head of the femur in the acetabulum with perfect restoration of the gait. In the future, he believed, this would be the result the surgeons would hope to obtain. He asked why relapses occurred, and thought that, in the majority of the cases, certain obstructions were present in the soft parts which might be overcome either by manipulation or by the knife, a question to be decided by the surgeon. At present it seemed to him that the manipulative method was the better one. In Boston mechanical force had been tried, and he thought the bone could be better guided in this way. In certain of the older cases he did not think reduction was practical, but in a large percentage of the cases occurring in children a cure was not only practical, but possible, and was to be expected. He believed the future would show fewer relapses. He did not think it was any more impossible to cure congenitally dislocated hips than to cure congenitally clubbed feet. Of the 130 cases reported from Boston there were practically 40 per cent. cured, a very good showing.

Dr. Shaffer thanked Dr. Ridlon for his careful and comprehensive analysis of the histories presented, and said that, while not agreeing with all his conclusions, he thought the paper presented many valuable facts, and the statistics presented formed a valuable and intelligent basis, the only one thus far for judging the operation and its results. He was not prepared to give a satisfactory analysis of the results obtained in all the patients that had come under his observations, and he wished only to mention those which had been, for a longer or shorter period, under observation in the State Hospital. These were only four in number, and all were operated on by Lorenz at the Cornell clinic.

The lessons conveyed by these cases, their behavior under treatment, their progress after the gypsum splint was removed, and the results thus far obtained were very interesting. Even at this date, he said, it was impossible to state definitely the ultimate results, and it might be months or years before this could be definitely determined. In all these patients the tendency to the condition known as "anterior transposition" was very evident. He believed the statement made by Dr. Ridlon that this was due to the muscular condition produced by the tearing, especially of the adductors, was correct. In the after-treatment of this condition he believed that one should study the "adaptive muscular conditions" (as he had termed it) more closely. He said that muscles shortened or lengthened when opportunities were given, as in an acquired talipes equinus, associated with hip disease, or even more markedly in infantile paralysis or in lateral curvatures. A muscle torn and extensively lacerated by the force necessary to reduce a congenitally dislocated hip might be many months before it could regain anything like normal contractility. It might even be years. Studying the results which had come under his observation, he said he would in the future give those lacerated muscles a much longer time to recuperate—say, a year or eighteen months—before discarding mechanical protection. In other words, after the plaster splint had been removed, a steel splint should be applied, as in infantile paralysis, embracing the pelvis, with a pelvic band, and embracing the entire limb to and involving the foot with antero-posterior motion at the hip, knee and ankle, with or without perineal pads. This would place the femur under the control of the surgeon as regarded in- or outward rotation, and the "weight-bearing" principle could be applied while the patient walked about and in the line sought for, *i.e.*, in the line which would maintain the head of the femur in the acetabulum. He believed that if this treatment had been followed in the patients he had watched, as well as some of Dr. Ridlon's, the percentage of perfect "anatomical repositions" would have been greatly increased.

Dr. Whitman did not consider the statistics of particular value because, if Dr. Lorenz' method was properly carried out in younger cases, there were better prospects of cure. He believed that 40 per cent. of these little patients with congenitally dislocated hips could be perfectly cured by this method. If the bloodless operation failed, he believed the open method should be tried.

Dr. A. Jacobi asked the earliest age at which babies should be operated on when they had congenital dislocations of the hip.

Dr. V. P. Gibney said that the cases at the Hospital for the Ruptured and Crippled were not yet ready to be reported, but he believed that their statistics would compare favorably with those given by Dr. Ridlon.

Dr. Ridlon, answering Dr. Jacobi's question, said the youngest child operated on was seventeen months old. There could be no question but that the earlier the operation the easier woul dit be; but, on the other hand, the younger the patient, the more difficulty would be encountered in retaining the head of the femur in the acetabulum. He said it should be remembered that these little ones had very delicate skins and, being placed so long in splints, wet themselves and the splints, requiring frequent changes, possibly once a week, for eight months. The period of choice was from two to four years.

AMERICAN MEDICAL ASSOCIATION

Section on Pediatrics

Regular Annual Meeting, Atlantic City, June 7-11, 1904

First Day—June 7.

The first session was called to order on Tuesday, June 7, at 2.30 p.m., with Dr. Charles G. Kerley, of New York, presiding.

The Demands of the Child.—This was the title of the Chairman's address. After extending a welcome to the members and guests, Dr. Kerley spoke of his impressions and thoughts which were the result of sixteen years' observation of children and their diseases. He spoke of the importance attached to the care of domestic animals, the mother is nourished and kept under conditions favorable to the production of a healthy offspring, and the young animal is even more carefully fostered. Only by so doing may the highest type be produced. This principle is recognized by the National Department of Agriculture, which makes practical application of these facts in the rearing of domestic animals. The physician should realize the still greater importance of the necessity of this supervision of the conditions surrounding the unborn child and of the proper nourishment, cleanliness and environment generally of the growing child. Each year should produce its proper amount of growth. Lost or retarded growth is rarely made up in a later year and always shows itself at maturity. Instincts in animals tells them what they shall eat. It tells man nothing, but he may be taught, and the physician must do this. In a series of observation among children of the laboring classes of New York, only twenty per cent. were found normally developed. The large percentage of the poorly developed was due not to insufficient food, but to the wrong kind of food. Early management therefore and particularly early nutrition of the child become of the greatest importance to the State, and education of mothers in all that conduces to the production of healthy children is our public duty as physicians. One reason why country children are generally stronger than city children lies in the fact that country mothers more frequently prepare the food, while the city mother depends upon food already prepared. Heredity is an important factor in the development of the child, but nutrition and cleanliness are of far greater importance. Many vocations now require a physical examination to prove the eligibility of the adult, and the public has a right to demand this, but the child also has an equal right to a proper preparation for this condition.

DEGENERACY AND PHYSICAL EXAMINATION—From the lack of this proper physical preparation of the child, criminals, degenerates and weaklings have been produced. A study of children in the New York Children's Court fully demonstrates the truth of this statement. Most of these were found to be under-developed, anemic and dirty, while not one-third of them had proper home surroundings. A merchant in New York City had, after physical examination, rejected 240 out of 250 applicants for positions requiring physical strength in young women. The condition of children in England, where 60 per cent. are underfed, is worse than in America, and there is cause for fear of the mental degeneration of children in the future unless the tendency of present conditions is altered. This should be done by governmental prevention of overcrowding and unhealthy conditions, such as are found in our large cities. Since ignorance is the larger cause of the improper conditions surrounding children the physicians who alone are particularly fitted to do so should teach the mother how to properly rear her children. It seems that the future of the United States depends upon the doctors more than upon any other professional calling.

ERYTHEMA NODOSUM IN CHILDREN.—Dr. Isaac A. Abt, of Chicago, in discussing this rare disease, said that the older and also the modern writers are not agreed upon the differentiation between the two varieties of erythema nodosum and erythema multiforme, but, he believes, that certainly erythema nodosum belongs among the exanthematous diseases, although Levene thinks that it is developed upon an angioneurotic basis and Fenger that it is due to a septic process. The disease occurs in anemic children or in those in a depressed condition from any cause, but it may occur in healthy individuals and generally appears from the second to the fourteenth year. Gastro-intestinal and other symptoms such as occur in exanthematous diseases are present at the beginning. The nodes which appear on the dorsum of the feet, upon the legs, thighs or forearms are round or oval and vary from the size of a walnut to that of a hen's egg. They have no well-defined border, and two never coalesce. They are firm to pressure and painful. The skin over them is tense, and at first bright red, but in a day or two this becomes rull red or bluish, and subsequently undergoes the color changes observed in a bruise. Together with these changes there is observed a subsidence of the pain, swelling and constitutional symptoms; but there are usually repeated crops. The nodes may appear in the mouth and break down, forming ulcers. The duration of a crop of nodes is from eight to fourteen days, while the time from the appearance of the first symptoms to the disappearance of the last crop of nodes may be three or four and sometimes even eight weeks. Some writers on the subject have believed rheumatism an etiological factor in erythema nodosum, but that clinical observations have not upheld this theory. The pain present in erythema nodosum, upon which those who have held this idea have based their belief, is also present in other exanthematous diseases, notably scarlet fever, measles, and smallpox, and that therefore this belief may not be well founded. The pain during the prodromal stage was due largely to the tensity of the skin at the site of the nodes. Endocarditis, septic in form, and meningitis also occur at times. Some writers have claimed that there is a connection between tuberculosis and erythema nodosum, but this has been disproved, particularly by Kühn. However, the relation, as shown clinically, is an intensely interesting one. Infectious diseases do prepare the way for erythema nodosum and many sequelæ similar to those which occur after exanthematous disease are likely to follow.

Dr. Liebenthal, of Chicago, suggested that the confusion in the classification of erythema nodosum as distinguished from erythema exsudativum might be lessened by remembering that one begins on the dorsum of the foot while the other appears first on the dorsum of the hands, and that the microscopical pathological findings were very similar to those present in urticaria.

WHOOPING-COUGH—A STUDY OF SEVENTEEN CASES TREATED WITH THE ELASTIC ABDOMINAL BELT.—Dr. T. W. Kilmer, of New York, said that he had applied this treatment to seventeen consecutive (not selected) cases and that the method was to apply a stockinette band extending from the axillæ to the hips and over this an elastic bandage of similar material to that used in elastic stockings, putting it slightly on the stretch and stitching the upper and lower edges to the stockinette band to prevent curling. If necessary to produce the desired results the bandage may be made tight. He showed charts of his cases indicating the ratio in frequency of the cough to the vomiting. During the first week of observation the child being only under placebo treatment this was as twelve to eight. After he applied the belt, at the end of one week he said the results were always marked, sometimes spectacular, and only in one case in eighteen did he fail to stop the vomiting, while in only six was their failure to stop or greatly lessen the cough, and in one case in which the coughing and vomiting had been entirely stopped by the application of the belt they began again when the belt was removed by the mother. He said incidentally that this method of treatment had been tried with success in the vomiting of pregnancy and in conclusion that he thought the application of the elastic belt should be given a fair and impartial trial in the treatment of whooping-cough, since in his experience it had apparently aborted many cases and had practically stopped the vomiting in all but one of the other.

Dr. Bernhardt, of Butte, Mont., suggested that perhaps the impossibility of the inspiration might be the cause of lessened cough.

Dr. Kerley said that he had seen the cases reported upon and noted the particular efficiency of the treatment in children of one year in whom the administration of drugs is difficult.

Dr. Gilbert, of Louisville, Ky., suggested the danger of hernia, since this sometimes occurs in the new-born after the application of the ordinary abdominal binder, and asked Dr. Kilmer's theory as to the cause of favorable results.

Dr. Kilmer said, in closing, that the friction of the belt was of course purely mechanical, that he had no case of hernia following the application of the belt and that in the cases reported he had given no other treatment and compared this treatment to the relief known to follow application of pressure over the stomach in sea sickness.

MALNUTRITION AND INFANTILE TUBERCULOSIS.—Dr. Louis Fischer, of New York, said that in the study of five thousand ordinary clinic cases of children belonging to the poorer classes the appearance of tuberculosis was noted in fifty-nine of them, and in seventeen hundred of the cases there was some form of pharyngeal or laryngeal disease, but no tuberculosis of the lungs or other organs. He said that of the tuberculosis patients only two were breast fed, and in these the mothers were poorly nourished and in no condition to nurse their babies, and that most of the tuberculosis cases showed improper nourishment as shown by poor frame, weak bones, flabby muscles and other evidences of rickets. His cases had been corroborative of the facts shown in the literature on the subject, and he thought that the majority of tuberculosis babies were bottle-fed babies, therefore the importance of cow's milk. He said that opinion was divided as to the route of invasion in tuberculosis, but that there were good reasons for believing that either the bronchial or the mesenteric glands might be first infected, and mentioned Dr. Osler as favoring the former and Dr. Delafield the latter route to the lungs. As to prophylaxis, Dr. Fischer said that if possible all babies should be breast-fed, so that the danger of faulty feeding is lessened, and in this connection he said that perhaps the serum of mother's milk may contain an immunizing substance acting in the child antagonistically to the tubercle bacillus, and that fresh air and sunshine were of equal importance.

Dr. Jacobi, of New York, said that if he were asked what he would do with the tenement house baby if its mother were tuberculous he would say, don't allow her to nurse her baby, not that the milk was dangerous, although it might be, because of the danger to the child because of her expectoration and the particles of sputum scattered about when she coughed. If the baby be removed from the mother its chances of growing up well and strong are greatly increased, but if it remains with the mother it will almost certainly become tuberculous. He said that milk from one cow is always dangerous, but that the danger is greatly lessened when a baby is fed with the mixed milk of a herd. He also said that intestinal tuberculization is certain and that he had demonstrated tubercle bacilli in ascitic fluid post mortem in a case where there were no lesions of the mucous membrane of the intestines, thus proving that the bacilli may pass through healthy tissues and that this was true also of lung tissue. Infections through the nose also occur, but that in reality it is not an infection by inhalation for the bacilli lodge in the pharynx and larynx, and when conditions permit infection occurs from there through the lymph spaces to the glandular structures of the neck and the mediastinum.

Dr. W. B. Ulrich, of Chester, Pa., said that there is a tuberculous diathesis in children of tuberculous parents, and that the beginning of prophylaxis should be in the control of marriage, and that a tuberculous mother should not have children.

Dr. Charles C. Browning, of Highland, Cal., emphasized the importance of isolating the child from the tuberculous mother, but questions the right to do this, and said that in Southern California, where there are many cases of tuberculosis in children is only one-tenth of one per cent. in children under eighteen months of age, but that this percentage rapidly increased after this age. He said that the control of infection by sputum should be insisted upon, and the use of carpets in houses where tuberculosis exists should be discouraged.

Dr. Fisher said, in closing, that the tuberculous mother certainly should be isolated from her child, and also, if possible, from her husband. He said also that a large percentage of children infected with tubercle bacilli had been previously fed upon condensed milk and that this was the cause of a poorly nourished condition of children.

How to Produce the Best Milk for Artificial Infant Feeding.—In this paper Dr. Edward F. Brush, of Mount Vernon, N. Y., called attention to the importance of cleanliness in both the surroundings and in the food provided for the cow which is to produce milk for infant feeding, and emphasized the fact that mental and physical conditions greatly affect the quality of the milk produced, and said that the mixed milk of a herd is greatly superior to milk from one cow which, he said, is always dangerous; that thoroughbreds and large producing varieties generally are usually the most liable to be affected with tuberculosis. Many cows, he said, might be safe enough for the production of butter and cheese, but at the same time might not be good producers of milk for the infant. Dr. Brush related personal experiences showing that a single cow may at times be apparently well, and yet may cause the death of infants fed upon her milk. He did not believe in modifying milk other than by the addition of sterile water and, if necessary, cream. Milk, he said, should be reduced in temperature, soon after milking, to 50 degrees F., and kept there till used, but of greatest importance was the gentle treatment of all cows, for experience had taught him that an irritated cow will produce milk that will cause illness in the baby fed upon it.

THE INITIAL CONTAMINATION OF DAIRY MILK.—In discussing this subject Dr. Richard Cole Newton, of Montclair, N. J., said that one of the most encouraging signs of the times is the interest and knowledge among the laity concerning all matters pertaining to hygienic living and particularly of dairy methods. It is popularly believed that milk is aseptic while in the cow's udder, but this had been disapproved by Kahn, who after most careful and elaborate attention to asepsis and antisepsis had found that cow's milk in the udder contained 242 bacteria to the cubic centimeter. Cow's milk, he said, is most frequently contaminated with dung which dissolves in the milk but carries enormous numbers of bacteria with it into the milk and that experimentation had shown that one-third of a grain carried with it seven million bacteria. Pure milk, he said, should be odorless and should have so slight a taste that most people would pronounce it tasteless and that the microscope would not detect all the contamination of milk nor would the Pasteur filter remove it. Many methods had been tried in the effort to remove the initial contamination, with greater or less success, and he described various milk pails which had been devised to prevent the contamination which occurs at the time of milking, at which time the greatest amount of dirt enters the milk and that the bacteria which enter the milk aferward multiply more rapidly than those which are present before withdrawal from the udder and, therefore, if these secondary bacteria are kept out the milk will keep in good condition longer than otherwise. The method recommended for prevention of initial contamination was to cover the milk pail with sterilized cheese cloth and to draw the milk directly from the udder through this into the pail which had, of course, been previously boiled, then bottled and reduced at once to a temperature below 50 degrees F. Such milk should not contain over 5,50 germs per cubic centimeter. This method was available to any farmer, and he should be encouraged to adopt it.

Dr. J. P. C. Griffith, of Philadelphia, said that simplicity in the care of milk is of paramount importance; that pasteurization and sterilization are useful, but only when other means of obtaining good milk were not possible. He said that the added cost of milk properly obtained was an objection, but that it was worth the added cost. The Philadelphia Pediatric Society, he said, granted certificates to dairies which kept the number of bacteria per cubic centimeter below ten thousand.

Dr. F. L. Smith, of Bridgeport, Conn., said that milk is very frequently rendered poor by improper food being given to the cows, and that the Jersey cow is most susceptible to poor food. He mentioned as an example of this a case in which a herd of Jerseys had fed upon partially decayed apples, after which five of them had become drunken, and said that surely milk from such a herd was not proper food for infants. It was a well-known fact, he said, that milk frequently tasted of the food which had been eaten by the cow, and that the farmer should be educated along the lines suggested by this idea.

Dr. L. C. Ager, of Brooklyn, said that every time milk is handled it is endangered, and that in recognition of this the Brooklyn authorities had recently instituted a change whereby all milk is bottled at the farm and not at the creamery, and that this had resulted in the sale of better milk. Difficuly, he said, had been found in compelling the dealers to conform to the requirements of the Brooklyn authorities as they had been found placing certification labels on poor grades of milk.

Dr. Southworth, of New York, said that he did not agree with Dr. Brush in that he preferred milk sugar to cane sugar when it became necessary to add sugar to milk. He said also that the time has passed when we thought we could make cow's milk equivalent to mother's milk, and that the importance of the situation would be more nearly realized if we should call the child's condition a pathological one when it is removed from the mother's breast. He said that he believed in pasteurization and sterilization when we have milk that has not been properly secured or is somewhat old, although he recognized the disadvantages of milk so treated.

Dr. Morse, of Baltimore, said that efforts to render milk free from initial contamination were important, but that proper modification of milk should not be neglected, and said that he, too, preferred milk sugar to cane sugar for addition to milk in its modification. He asked Dr. Brush what should be the cost of good milk.

Dr. Hamill, of Philadelphia, said that investigation of the actual cost of producing good milk in Philadelphia had shown that seven and three-quarters cents per quart was the minimum cost per quart. He said that a milk pail similar to the one advocated by Dr. Newton was in use at the dairies near Philadelphia.

Dr. Gilbert, of Louisville, said that he had had very good results from sending sick children and infants to places where they could get milk while it was still warm with the animal heat of the cow.

Dr. Brush, in closing, said that he wished to emphasize the importance of obtaining milk from cows which had been gently treated. This, he said, was of even more importance than the exclusion of contaminating materials. He said that he preferred cane sugar in treating milk because experimentation had proved to him that milk sugar is practically inert, and because the commercial sugar is not pure. The cost of producing milk, he said, was about six or seven cents per quart, and that the best milk is worth on the market from fifteen to twenty cents per quart. He further said that raw milk had always proved preferable to modified milk in his experience, and cited cases to support this statement.

Dr. Newton said that, contrary to popular belief, milk which has undergone lactic acid fermentation was not always good. The lactic acid bacteria tend to inhibit the action of other bacteria and may therefore be beneficial. In regard to sterilization, he said that when he had fed mice on sterilized milk exclusively they had died at the end of twenty-five days. He endorsed Dr. Brush's advocation of the gentle treatment of cows as productive of a better quality of milk.

CHRONIC CONSTIPATION IN INFANTS.—Dr. J. Ross Snyder, of Birmingham, Ala., defined constipation as "any condition in which products of food are retained in the bowel after they have lost all nutritive power," and then went carefully over the conditions which tend to produce this result in the infant. The abdomen of the infant is such that it conduces to the accumulation of waste products in the bowel, since the lumen of the intestine is proportionately smaller than that of the adult and also longer, while the pelvis is smaller. This, he said, causes a distention of the abdominal wall and unless food such as the infantile digestive organs can care for is given to the child constipation follows; that some have thought that constipation in the mother produces an inherited tendency to constipation in the child, but this he said is not true; that although the child of a constipated mother might be more liable to constipation it was due to altered milk secretion due to improper food taken by the mother, and later in the child's life, to the subjection of the child to the same improper alimentation and lack of proper conditions from which the mother suffered. Tight diapers and other causes of pressure upon the abdomen are factors also in the production of constipation as are irregular and overfeeding, lack of bulk or the proper amount of fats, but the most constant cause is improper diet and in treating the condition this should always be borne in mind. The alleviation of constipation by drugs, while necessary, should not be the object of treatment, as the cause should be eradicated and this could almost always be done by attention to the child's diet. Suppositories, injections and similar measures are to be discountenanced, and massage of the abdomen should never be used in the treatment of constipation of infants.

Dr. I. A. Abt, of Chicago, said that the prevalent idea of fats in the production of constipation is erroneous and that occasionally there exists a tonic spasm of the sphincter and muscle which may be overcome by the introduction of a clinical thermometer into the anus.

Refractive Errors in Children.—Dr. J. H. Claiborne, of New York, reviewed the forms of those conditions which produce eye-strain, noting four general conditions, the ametropic eye, the hypermetropic eye, themyopic eyes and the astigmatic eye. He condemned the custom of putting too much work upon the growing child and particularly in the condition in which the association of the extrinsic eye-muscles with the faulty refractive condition in the attainment of single binocular vision is productive of symptoms of eye-strain. The evidences of eye-strain, he said, are headache, frontal or occipital, irritability, nervousness, lack of concentration, etc., and that so clearly does the child show the signs of eye-strain in its face that an experienced ophthalmologist can almost always diagnose the form of refractive error by the expression on the face of the patient. In reviewing the conditions considered at various times as the result of eye-strain, he said of migraine that it could always be modified by correction of refractive errors and many times it might be prevented, of epilepsy and insanity he said that he did not believe it could ever be cured in this way nor could paresis or paralysis be influenced. Hysterical manifestations may be modified but only by distracting the attention of the individual from the point of numbness or other abnormal condition which may be present. He did not believe that the chorea of Sydenham was ever cured by glasses, but many cases diagnosed chorea are merely cases of eye-strain in which the efforts of the patient to secure single binocular vision are productive of facial contortions which resembled the twitchings of chorea. These, of course, could be influenced by the proper treatment of ocular errors. A frequent cause of nausea and other digestive disturbances, he said, is eye-strain, and any child that has these disorders or is not up to the average in its work in school or elsewhere should be examined for refractive errors. In conclusion Dr. Claiborne said that (1) nervous symptoms of a variety of kinds occur as the result of eye-strain. (2) Eye-strain is due to refractive errors, to imbalance of the external ocular muscular system, or more frequently to a combination of the two. (3) Of these two the refractive errors are by far the more frequent cause. (4) Muscular imbalance alone may cause it. (5) Headache is by far the most common nervous symptom caused by eye-strain. (6) The headache is chronic or induced directly by near work and is generally in the forehead and temples. (7) Migraine or hemicrania due to eye-strain is comparatively rare in children. (8) Any nervous symptom in children should arouse the suspicion of ocular defects either as a direct or contributive cause. (9) Correction should be made under atropine.

CONGENITAL OCCLUSION OF LACRIMAL CANAL AND ACUTE CONTAGIOUS INFLAMMATION OF CONJUNCTIVA.—Dr. John E. Weeks, of New York, said that this condition was frequently mistaken for conjunctivitis, because of the pus which usually forms at the mouth of the duct. Differential diagnosis is to be made by bacteriological examination of the pus. Of the treatment he said time should be allowed possibly two or three months, for nature to open the duct, but if this does not occur the duct should be opened by instrumentation. He said that acute contagious conjunctivitis in infants is due to infection by one of three organisms, the gonococcus, the pneumococcus, the Klebs-Löffler bacillus or the Koch-Weeks bacillus, that the value of the assistance which this gave in treating the condition in the eye as well as the original site of infection and in the management of epidemics. The virulence of the conjunctivitis, he said, could not be depended upon as an indication of the form of the infection, as there were cases of gonorrheal ophthalmia which were so mild that they might be mistaken for ordinary muco-purulent conjunctivitis, but that these same cases were capable of setting up severe ophthalmia in other individuals or of the opposite eye in the same individual. The treatment of the different forms of conjunctivitis should be cleanliness obtained by the use of boracic acid solutions and the proper application of cold or heat, being governed in this by the form of the infection—cold acting best in those cases which are due to organisms which grow best at high temperatures, this he said, was particularly true during the early stages of the disease. The diphtheritic form should, of course, be treated by antitoxin injections. The silver preparations are useful in the gonococcus infection, but local treatment should be exercised, not to interfere with the nutrition of the cornea.

In discussing Dr. Claiborne's paper Dr. Bennett, of Buffalo, said that in examining the eyes of truant children he had found a large percentage of refractive errors, thus in a measure accounting for their lack of interest in their school work, and said that in several cases of persistent vomiting he had found the cause in the eyes of the patient.

Dr. Jarecky, of New York, said that he had followed up many cases of chorea treated at the German Policlinic and that correction of refractive errors in these cases had not been followed by improvement in the choreic symptoms in a single case. Glasses, he said, which are used to correct astigmatism in children, should be worn only temporarily and should be considered merely one of the resources at our command for restoring the child to normal condition.

BACTERIOLOGY OF SUMMER DIARRHEA.—Dr. Wm. H. Park, of New York, pointed out the great difficulty of finding the specific bacterial cause of any given case of diarrhea because of the large numbers of organisms present normally in the intestines, many of which are not ordinarily inimical to health, but which under conditions occasionally arising might be productive of severe diarrhetic symptoms. He said that of the enormous numbers of bacteria always present, only a very small number of forms was pathogenic, and of these the ones studied so closely resembled the colon bacillus in their biocultural characteristics that great difficulty had been experienced in isolating them. The term colon bacillus, he said, covered a great group, some varieties of which were pathogenic and developed at times at the expense of the other forms producing a diarrhea. The Shiga bacillus which had been isolated from the stools of dysentery patients in Japan was not the same as the dysentery bacillus found in this country, which, however, it closely resembled. In regard to the serum treatment of dysentery he said that results had been unsatisfactory presumably because when inflamed conditions exist in the intestinal tract it is practically impossible to counteract the activity of all of the pathogenic organisms present.

INFANTILE DYSENTERY.—Dr. J. H. Mason Knox, Jr., of Baltimore, analyzed 43 cases in which the *Bacillus dystenteriæ* (Shiga) had been found in the stools. These showed that the infection was borne by some common carrier and a close study, he said, had practically excluded previous conditions as to surroundings, foods, etc., and that drinking water was no doubt the means by which the bacillus entered the body, although the possibility of the house fly as an infecting agent must be considered. The Harris acid-mannite organism, so-called, was found in each case, but the clinical picture varied greatly, two general types occurring, however, one in which profound toxemia was present, the other being characterized by the severity of the bowel symptoms with mucous or bloody diarrhea. The difference in the symptoms may be due to the greater or less activity of other bacteria, e.g., streptococci or staphylococci.

BACILLUS DYSENTERIAE AND INFANTILE .DIARRHEA.—A study of 237 cases by Dr. L. Emmett Holt, of New York, showed that the bacillus may act pathogenically not only in summer but also during the winter months, and diarrhea occurs as a result both in children previously healthy, and in those already more susceptible because of disease, it occurs in various forms and under all conditions, but previous conditions were found to have influenced the course of the diarrhea, as for example, 26 of the cases were breast-fed babies and presented milder symptoms and offered greater resistance to the disease, while of the 73 fatal cases the majority were among the hospital type of patients. In the management of diarrhea Dr. Holt advocated the withdrawal of milk as an article of diet particularly in the severe cases, and because of the probable infectious character of the discharges from the bowel these, he said, should always be disinfected. He urged further study of the serum treatment and expected favorable results from its use in those cases of diarrhea in which the problem is to treat the infection and not the general condition which was present in so many cases before the acute symptoms occurred.

DIARRHEA IN CHILDREN.—Dr. J. C. Cook presented a study of 29 patients in the investigation of which he had attempted to prove a connection between the bacteria in the buccal cavity and those present in the intestines. His results were negative.

MANAGEMENT OF SUMMER DIARRHEA.—Dr. Thomas S. Southworth, of New York, said that this should begin before hot weather by hygienic and dietetic prophylaxis. The danger he said among infants was chiefly in proportion to artificial feeding and the greatest safety is secured by heating the milk, however pure. Among older children errors in diet as well as bad milk are exciting causes, but local conditions and lesions once started are progressive and are intensified by a milk diet and under these conditions toxemia is the prominent factor. In severe cases prompt elimination of milk from the diet reduces the mortality. Opium should be used only to control excessive peristalsis. During the discussion of the foregoing papers on summer diarrhea the value of the so-called water treatment of the French physicians was emphasized, but that because of differing social conditions the substitution of barley water for plain sterile water was preferable in this country, that attention to absolute cleanliness, preliminary flushing out of the bowel followed by the "starvation" plan of treatment with little or no opium followed by gradual resumption of a carbohydrate diet were the chief factors in the successful treatment of summer diarrhea in children.

LANDRY'S PARALYSIS.—Dr. Henry Enos Juley, of Louisville, Ky., reported a case of this little known disease and suggested the possibility of a specific organism as a cause.

HEMATURIA IN INFANTILE SCURVY.—Dr. John Lovett Morse, Boston, said that although hematuria was generally considered an unusual complication of scurvy it is in reality a frequent symptom, that hematuria in a child accompanied by tenderness along the spine and elsewhere was a sufficient cause for making the diagnosis of scurvy, particularly if it cleared up upon the administration of antiscorbutic treatment—orange juice being the most frequently used in his practice.

Dr. Stowell, of New York, said that hematuria of scurvy and the hemorrhages into the skin are probably due to a common cause, possibly a specific germ.

INTESTINAL OBSTRUCTION IN CHILDREN.—Dr. John F. Erdmann, of New York, said that obstructions are due to intussusception, strangulated hernia, post-operative hands or Meckel's diverticulum. Intussusception, he said, was not a common cause and when it is met with it is not the sausage-shaped tumor of the text-books. Frequently it closely resembles floating kidney, or appendicitis and differential diagnosis may not be possible till laparotomy is performed.. The symptoms were, he said, severe, sharp, colicky, abdominal pain, recurring periodically with an elevation of temperature. Treatment of this condition is mechanical, which consists of attempts to reduce it by enemas, but this should never be continued longer than six hours, after which operative treatment should follow. The danger in depending upon injection lies in the liability to reduce all of the intussusception except the part at the iliocolic junction and having at the same time a subsidence of symptoms, but which would be followed by more severe symptoms later when the remnant of the intussusception became gangrenous. In spontaneous reductions or those produced by injections the test of the completeness of the reduction should be the passage of a large bowel movement.

Dr. Abt added one other form of obstruction to the foregoing classification—that due to paralysis of the gut during the course of a profound disease elsewhere, such, for instance, as occurs in pneumonia; ptomaine poisoning may also simulate intestinal obstruction.

Dr. S. W. Kelly, of Cleveland, Ohio, said that if seen early spontaneous reduction might follow the use of opium, and that in the treatment by enema pressure of four or five pounds continued for fifteen or twenty minutes beginning with air and following this by water, often produced a complete reduction where less pressure or pressure withdrawn after a shorter period of time might not effect a reduction.

Dr. Erdmann said, in closing, that he had always found great difficulty in keeping either the air or the water in the gut and that too great pressure was dangerous because of the weakened and edematous condition of the gut wall, but injection at the time of the operation was helpful.

PERINEPHRITIS IN CHILDREN.—Dr. Wisner R. Townsend, of

New York, said that this condition is rarely diagnosed correctly, and almost never before the formation of an abscess, but differentiation he said is possible. The conditions for which it may be mistaken are Pott's disease or hip-joint disease from which it may be diagnosed by the difference in the appearance of the stiffness about the part affected in the former and in the immobility of the hip-joint in the latter, from lumbago in the absence of leucocytosis in this, while an increasing leucocytosis occurs in perinephritis. The treatment, he said, is expectant—rest in bed and milk diet, till abscess formation, then it should be operated upon.

Dr. Jacoby called attention to the etiological importance of constipation in this condition. .

DIAGNOSIS OF ENLARGED BRONCHIAL LYMPH-NODES.—Dr. Alfred Friedlander, of Cincinnati, said that although great difficulty is present in making a diagnosis of this condition, the enormous frequency of tuberculosis of these glands, as shown by the post-mortem examinations, made even a presumptive diagnosis of vast importance. Of value in this connection is a peculiar paroxysmal cough similar to that of pertussis but without the blowing inspiration, dyspnea or exertion with no heart lesion, hoarseness, with the general indications of a tuberculous condition, all these, with possibly evidences produced upon palpation and percussion over the mediastinum will give highly presumptive indications of tuberculous glands. The possibility of an enlarged thymus gland must not be forgotten, and also that enlarged bronchial glands may occur in pertussis and in measles. He said also that he had found in ten cases in which there were clinical symptoms of enlarged bronchial lymph-nodes, a reactionary lympho-cytosis. He hoped further investigation might prove this a more certain method of diagnosis in this condition.

Dr. T. W. Kilmer, of New York, said that the cough, such as had been mentioned by Dr. Friedlander, was frequently due to abnormal retropharyngeal conditions.

EARLY AURAL EXAMINATIONS IN ACUTE DISEASES IN CHILDREN.—Dr. James F. McKernon, of New York, said that middle-ear complications are far more frequent than is generally observed, that if aural examinations were regularly practiced as a part of every physical examination the cause of continued elevation of temperature after other symptoms had subsided would be more frequently found. It is a fallacy, he said, to think that pain is always present in otitis media since a large percentage of cases never have any pain at all and careless otoscopy may not reveal the true condition of the drum. As an example of deceptive appearances he described a condition in which there was apparently a normal drum. but upon touching it with a probe, that which had seemed the drum was only

desquamated flake of epithelium which crumbled, and came
v, revealing an inflamed drum behind.
. Fischer, of New York, said that he had frequently ob-
cases of acute disease in children in which there had
bsidence of all symptoms except restlessness at night,
s having normal temperature and pulse. This had
d by spontaneous perforation of the ear drum and
pus with a complete clearing up of symptoms.
rigation of the nasal passages, he thought, was
use of middle-ear disease.
rley reviewed 51 cases of acute otitis media in chil-
34 of which there was no pain or local manifestation;
only reason for making an aural examination being an ele-
ation of temperature.

Dr. McKernon further said that if the ear drum bulges at all it should be incised at once, and there were many cases in which because of the danger of jugular bulb, or mastoid involvement paracentesis should be done even before bulging occurs. He said also that those cases of mastoiditis which had not been operated upon for the purpose of evacuating the pus usually resulted in deafness.

Some Physical Signs in Children not Sufficiently Emphasized.—This paper, read by Dr. Samuel McClintock Hamil, of Philadelphia, gave the results of observations made by himself and Dr. Theo. LeBoutillier on a large scale number of normal children. Of the lung they found the following conditions peculiar to children: (1) An area of impaired resonance under the left clavicle. (2) An area over the root of the lung in which there is a transmission of bronchial type of breathing. (3) Position greatly influences the percussion note. Of the heart: there was found a slight difference in the outline of heart dulness, but more marked was the fact that up to the sixth year the apex beat was found in the fourth interspace in the midclavicular line.

Hernia in Infancy.—Dr. Wm. B. Coley, of New York, said that the question whether the treatment of hernia in children should be mechanical or operative should be answered only when all conditions surrounding the individual child had been considered. If the child could be properly cared for and watched to see that the truss was kept in position then this method should be tried up to the age of four years. If, however, the truss does not retain the hernia, or if the hernia is irreducible or there is an accompanying hydrocele, or, if strangulation occur, a radical operation should be performed. If after trial of mechanical treatment up to the fifth year there is no cure of the hernia then operative treatment should follow. If seen after this age for the first time, and there has been no treatment by means of a truss, the peculiar conditions present must be considered in deciding upon the best treatment. In the treatment of umbilical hernia, the use of a flat button covered with soft cloth should be applied over the umbilicus and held in place by means of adhesive plaster. The Bassini operation is the one preferred by Dr. Coley, using, however, kangaroo tendon instead of silver wire as sutures and transplanting the cord as is the custom of most surgeons at the present time. He said that the belief that malignant disease is liable to occur in an undescended testicle was not upheld in his experience, as he had seen only one case of this in an experience of 1,260 cases operated upon, and that there had not been one case in the 60,000 recorded at the Hospital for Ruptured and Crippled. Strangulation, he said, is comparatively rare in children, and when it does occur it is due to adhesions and does not occur at the neck of the sack. As to the results of operative treatment in children the risk is very small (less than one per cent. of infections at the site of operation since the advent of rubber gloves, and only four per cent. before that), and as any operative treatment will be more productive of good results in the child than in adults the chances of permanent cure are practically certain.

Chorea.—Dr. W. C. Hollopeter, of Philadelphia, said that there is now less chorea than there was fifty years ago, and that this was due to the improved hygienic surroundings of the child. Much is said about the excess of school work put upon the child of today, but he thought that this was overvalued in its causation of chorea, the effect of poor personal hygiene in the home surroundings, irregularity in daily life, over-feeding, etc., being more potent. One writer on the etiology of chorea has said that it is a brain disease, while the relation between rheumatism and chorea is an interesting question not yet settled. The most important contribution to the knowledge of this disease has come from the discussion at the meeting of the British Medical Association in July, 1903, the essence of which was that chorea is a disease of microbic origin. A diplococcus has been isolated from cases of chorea and there seems to be reason for the belief that this is implanted upon a previous micrococcus infection making, if this is true chorea, a mixed infection. A diplococcus has also been isolated from rheumatic patients which is believed to bear a close relation to that of chorea.

In the treatment of chorea, Dr. Hollopeter has abandoned the use of specific drugs and depends upon prolonged warm baths. These he gives twice daily, each one lasting from one to two hours. The temperature of the bath should be such as to give the child no unpleasant sensation (usually from 90 degrees to 98 degrees F.). From this temperature it is cooled down till it soothes the whole cutaneous surface. After the child has been in the bath for the required time, gentle massage is givn and the child dried and allowed to sleep. In from 50 to 60 cases treated in this way he has reduced the duration of the attacks from three months to six weeks.

NASAL AFFECTIONS OF CHILDREN.—Dr. Louis J. Lautenbach, of Philadelphia, said that children are great sufferers from obstruction of the nostrils. They are very prone to diseased conditions affecting the nose and occluding the passageway. The mischief thus occasioned is common, and unfortunately often very serious to the life of the child as well as to its health. Along the respiratory apparatus tonsillitis, pharyngitis, laryngitis, but particularly bronchitis and pneumonia, are commonly so caused—in great part by the mouth-breathing. Stomach and intestinal disorders are frequent results of nasal disease. Nervous affections and lack of mental and physical development are by no means unusual. General lack of vitality and tha indefinable something called a cold are frequent results. Lack of development of the dental arches and irregularities in tooth formation as well as placement can very often be traced directly to nasal disease, the widespread mischief thus caused lasting often through life. An impartial, unbiased examination will nearly always develop a satisfactory diagnosis. The connection between secondary conditions and the primary cause may not be clear, but when once understood the local and general treatment can be instituted harmoniously and the results will more than repay for the difficulties encountered. Fortunately nasal troubles are easily cured as a rule.

MYXEDEMA AND DIABETES MELLITUS.—Dr. A. A. Strasser, of Arlington, N. J., made a very complete report of this unusual combination.

EDITORIAL

BACKWARD, TRUANT AND DELINQUENT CHILDREN

A new movement has been inaugurated by a recent National Conference on the Education of Backward, Truant and Delinquent Children, which body, primarily enrolled with 100 members, met at Portland last month.

That such a philanthropic movement should be inaugurated largely by institution workers is to be expected, but there was abundant evidence of a widespread interest from all states in the union.

Abundant material, indicating careful thought, was presented at the meeting. In this place we can only touch upon some of the topics most closely related to medico-social events referring our readers to *Charities*, June 25, for further exposition of the papers read at this meeting.

In speaking of our modern school systems Dr. W. W. Stetson, State Superintendent of Schools of Maine, said that three criticisms of modern day schools of all classes had been and were being made. He said that it was alleged that "We are pulling all sorts of children through the same kind of a hole; that we are attempting so many things that it is not within the range of possibility for us to do anything well, and that we do a little in many cases, and in others do nothing to fit the child for useful work. It is said," he continues, "that we take no note that some children are tall and some are short, that some are brilliant and others are stupid; some are versatile and can grasp many things, others can do but few things. It is charged that instructions are furnished for average children in an average way and that a general makeshift takes the place of individual attention to individual needs."

These statements might all be true, and yet they are far from covering the situation. Dr. Stetson said that in the schools under consideration there are three distinct classes of children. In the first class which is the largest, are what may be called the intellectual children, those who love to go to school, have a liking for books, settle to their desks and do their work in a fairly creditable way—the boys and girls of the old-fashioned time and of the blood that flowed in our ancestors' veins, boys and girls who have intellectual strength, power, stamina, backbone, resolution and capacity to do and do well.

In the second division are those children who dream dreams and see visions, and, if they are fortunate to fall into wise hands, grow into poets, musicians, painters; those wonderful people who know more about the future than all historians know concerning the past, who see days that have not yet dawned, people who are difficult to handle, uncertain in management and liable to drift into all sorts of strange ways if the teacher is not wise enough to see what these sensitive, emotional, delicate children need to make them what God made it possible for them to become.

In the third class we have the physical child—the child that wants to see, to manage, to handle work, and to work over, to work in and to work out, and then to enjoy what is possible for him to become.

Reference was then made to three other classes, but few examples of which are to be found in Maine—the deficient, incompetent and delinquent. In the state during the past year there were 425 children btween six and fourteen years of age who applied for admittance to the common schools who were considered unfit for the instruction given. To arrive at the number who properly belong in this class the speaker multiplied by four the number thus ascertained.

In one class are the strays, the freaks and odd ones, children who are everything by turn and nothing long; children who are saints today and very far from being sweet sinners tomorrow; children never to be counted upon. Dr. Stetson told of such a child in a Maine town who became such a pest that the teacher in a moment of irritation expelled him. As he went along the highway the boy fell into bitter mood, thinking that he had been abused. He came upon a group of people about a balky horse. The owner had tried various means unsuccessfully. The boy gathered some damp snow, moulded it into a smooth, hard snowball, and held it under the horse's nose. The horse became restless, then started with the load. The owner turned and thanked the boy. "Don't bother," said the lad, "the next time that horse stops give him a new sensation." It was the impression of the speaker that the boy had exactly diagnosed his own case. He was strung with so many strings that he needed not infrequently a cold snowball pressed against his nose.

Dr. Stetson advocated that such influences be brought to bear upon fathers and mothers that intelligent and sympathetic study of children be made a part of the regular responsibilities of fathers and mothers. He condemned the present curriculum of the common school, with its twenty-seven or twenty-eight subjects. "Give the teacher time," he said, "to set the intellectual boy upon his feet, open the windows for the poet and artist, put the physical child in contact with life and nature to determine who are the incompetents and criminals and to hold steady the child that walks all right sometimes and all wrong many times. One of these days, through philanthropic agencies, through local assistance, through state aid, we shall have specialists whose business it will be to work with the children and with the teachers, to tell us what to do and how to do it, and then we shall have that condition of affairs which will make it possible for every child to have a fair chance to make the most of the best in him."

Other papers dealt with Manual Training, Religious Training, Problems of the Colored Girls, Calisthenics, Truancy, and a symposium on questions of interest to institution managers was held, and the discussions practical and animated. We wish the new organization success.

PEDIATRICS AT THE AMERICAN MEDICAL ASSOCIATION.

As promised in our June issue we in this month's issue of PEDIATRICS give a brief abstract of the Pediatric Section of the American Medical Association recently held at Atlantic City.

While no new discoveries were heralded at this meeting, the large and appreciative audience dispersed to their several homes with the firm conviction that the section meeting had been a great success and that they had all profited immensely by being there.

ABSTRACTS

Spasmodic Croup in Children.—Certain local cramps in children are regarded by some observers as being analogous to tetany in adults. A. Japha deals with this subject in the Berl. klin. Woch., December 7, 1903. After total extirpation of the thyroid gland, and in consequence of severe motor disturbances of the stomach, adults sometimes exhibit tetany, which is evidenced by cramp attacks affecting the hands and feet, and between the attacks by the so-called latent symptoms. These latent symptoms are divided into three groups: (1) Chvostek's phenomenon, which consists in a contraction of the muscles of the face on the same side, and at times on the opposite side also, after percussion of a branch of the facial nerve below the hyoid bone; (2) Trousseau's phenomenon, which consists in the production of the "gynecological" position of the hand after pressure on the internal bicipital groove; and (3) Erb's phenomenon, which consists in the increased irritability of the nerves tô electric currents. The reasoning for considering spasmodic croup of children as a tetany is that these local cramps, general convulsions, and croup accompany one another as the nervous symptoms of rickets. Much difference of opinion has been expressed as to the correctness of this view, and several eminent observers refuse to regard any case without the manifest cramps as tetany, even when the three classical symptoms of latent tetany are present. Of the last-named symptoms, the facial phenomenon is without doubt of the least diagnostic importance, and it may be met with in other conditions. Most authorities regard Erb's phenomenon as more important than the median nerve reflex, and Japha therefore turns his attention especially to it. It is not all easy to determine whether the irritability of a nerve to electrical stimuli is increased or not, since it is not fair to compare the results with various faradic apparatus and with galvanic currents, taking the pathodal closing contraction (KCC) as the test, not only will very weak currents elicit a contraction, but normally the strength will be found to vary within wide limits. Mann and Thiemich have offered a solution to this problem by showing that there is a law of contractions; if one places one electrode of a galvanic current on the sternum, as the "indifferent" electrode, and the other on the nerve as the "different" electrode, and passes a very weak current through, one will be able to determine the time when a contraction is only obtained on closing the current when the different electrode is represented as the kathode. On increasing the strength of the current one obtains an increased kathodal closing contraction (KCC), and also an anodal closing contraction (ACC); when the current is still further strengthened there is added an anodal opening contraction, and, when it is still further increased, a kathodal opening contraction as well. The order of the law of contraction is therefore: KCC, ACC, AOC, KOC. They found that in tetany at times the AOC appeared before the ACC, and, more frequently still, one obtains a KOC with quite weak currents. There can be no doubt that there is increased electric irritability when a KOC is obtained by currents of under 1 milliampère. Japha tested all the cases of children whose mothers stated that the child had suffered from croup, numbering 119 in all, and found increased Erb's phenomenon in 71 per cent.; but, since some of these must be excluded from belonging to true cases of spasmodic croup, he estimates that the real percentage will lie between 80 and 90 per cent. In order to give this find a good ground he tested normal children, and found that among 304 17 per cent. only showed any departure from the contraction law. He, however, points out that many of the children had suffered from various nervous disorders, and that some of them may, perhaps, have been disposed to a form of tetany. With regard to Trousseau's phenomenon, he found that only 44 per cent. of the children suffering from spasmodic croup whom he examined for it showed the peculiar position of the hand, and states that in 22 per cent. of the children there was a spontaneous "gynaecological" position of the hand. In healing with the pathogenetic conditions of spasmodic croup he states that very little is known as to the actual causes of it, but as the attacks are most frequent in winter time, when the hygienic house conditions are at their worst and the disease is only met with in children who are fed on cow's milk, one can assume some causal connection between these factors and the disease. The cramps often disappear rapidly on stopping the milk from the diet, and, with careful dieting, one may succeed in preventing a recurrence of the symptoms. The influence of the diet appears, however, only to make itself evident secondarily in response to a functional disturbance of various organs.

Obstructions to Suckling: Imperfect Nipples: Cyst of Nipple.—Bouffee de Saint Blaise (Comptes Rendus de la Soc. d'Obstét., de Gyn., et de Péd. de Paris, vol. v., 1903) writes a full clinical report of a woman, aged thirty-seven, delivered of her fifth child. An abscess developed in the right breast at the sixth month of the fifth pregnancy. That breast, however, had never discharged its functions, but its fellow, though never the seat of abscess, was also useless for suckling. Milk filled both after each pregnancy, and the right breast had already suppurated twice. On further inquiry it transpired that this patient had been warned before the birth of her first child, by her own mother, who had borne ten children and suckled them all from the left breast only. The patient herself had given up all attempts to suckle after her second pregnancy. The nipples were retracted, yet easily drawn out, not a trace of any duct orifice could be detected on the right side, but one, and one only, was discovered in the left nipple, a little milk exuding after firm pressure. The breasts were strapped and their secretion suppressed.—Lepage (ib.) reports a case where a primipara, aged twenty-nine, was unable to suckle from the right breast. A pedunculated papilloma two-fifths of an inch in length was attached to the inner aspect of the nipple. The infant insisted on drawing it, and not the rest of the nipple, into its mouth. The tumor was therefore excised under chloride of ethyl analgesia, and the child afterwards took the nipple naturally.

The Action of Arsenic on the Kidneys of Children.—Scofone and Brinda have reported that the therapeutic use of arsenic causes hyaline and granular cylinders, of renal epithelium and of red blood corpuscles in the urine. To investigate this observation Gianasso (Giornale della R. Acad. di Med. di Torino, November, 1903) carefully examined the sediment from the urine of 22 children all treated hypodermically, or by the mouth, by large doses of arsenic. In three of the cases the drug was pushed beyond the limits of tolerance, but the symptoms were gastric and intestinal, not renal. In no case were casts, renal epithelium, or blood corpuscles discovered in spite of repeated examinations, Gianasso therefore concludes that in the case of children whose kidneys are healthy to begin with, the therapeutic use of arsenic is free from danger.

Causes of Death in Diphtheria.—Erik Faber, in a dissertation for the M.D. degree of Copenhagen, points out that the cause of death in diphtheria depends upon the intensity of the infection, the disturbance of the circulatory apparatus, and the respiratory lesions, paresis and general complications. Out of 56 cases of which he studied with special regard to the changes in circulation, he was able to ascribe five distinct series of alterations. In two groups death occurred through the actions of the toxin upon the vasomotor center, in another the lethal symptoms were those of poison by carbon dioxide, in another group there were no important changes in the cardiac muscles. Faber did not observe any distinct cardiac paralysis. He considers that death in this group was due to paralysis of the respiratory center. In most of the cases the blood pressure was unaltered; in the worst cases it always fell during the first fourteen days, and only returned to normal about the beginning of the fifth week.

Acute Primary Pyelitis in Infants.—M. HARTWIG (Berl. klin. Woch., November 20, 1903) deals with a condition which he considers may not be very rare. The difficulty in securing the urine in infants is probably the reason why this condition has not attracted attention until now. He finds that acute primary pyelitis is more like typhoid clinically than anything else. At first the temperature rises and no other sign is present. The spleen cannot be definitely made out to be enlarged, Widal's test is negative, and there are no physical signs in the lungs. The diagnosis of meningitis may be thought of, but the want of other symptoms soon puts this out of court. If the urine is then examined it is found to be turbid, full of bacteria and pus cells; there are no casts, and the amount of albumen corresponds to the amount of pus. The treatment appears to be a thorough cleaning of the genitals, and urotropine and turpentine. Hartwig suggests that symptomatic antipyresis and sodium bromide may assist in warding off eclamptic symptoms. He makes a special point of separation of these cases from those of secondary pyelitis, dependent on pyaemia, vulvovaginitis, and says that if one will only take the opportunity of examining the urine in cases of infants who have febrile disturbances, insufficient to explain the cause of the fever, it will soon be found that primary pyelitis is by no means rare.

The Life-History of the Organism of Small-pox.—GARY N. CALKINS delivered a lecture on this subject at a meeting of the Biological section of the New York Academy of Sciences on November 14, 1903 (Medical Record, November 14, 1903). He said that Councilman had pointed out that the organisms found in vaccinia were limited to the cell bodies of the Malpighian layer of the skin, whereas in small-pox they were found both in the cell bodies and the cell nuclei. He also showed that the inclusions were protozoa. The lecturer said that in the parasitic diseases due to the protozoa there was usually some phase of the disease which corresponded with some phase in the asexual development of the parasite. The ordinary asexual development of the organisms took place in the cell bodies of the Malpighian layer of the skin, while the more important sexual reproductive processes occurred in the nuclei of those cells. Calkins had been fortunate enough to be selected by Councilman to work out the life-history of the organism of small-pox, and through the courtesy and liberality of the same gentleman he was permitted to present those results at this time. Most of the work had been done in connection with the epidemic of small-pox in Boston. His own work had been done mainly upon 22 cases, representing nearly every variety of small-pox. It was below the pustule that one found the organism of small-pox. This organism was a minute, homogeneous body situated in the cell protoplasm. Calkins described in detail the various phases of the life-history of this organism, the Cytoryctes variolæ Guar, by the aid of a series of lantern slides, many of them photographs from actual specimens. He pointed out that in vaccinia only gemmules formed, the remainder of the process of development being, for some reason, inhibited. In the late vesicle stage of true small-pox there was found a most characteristic process of reproduction, an auto-infection, that is, the formation of the pan-sporoblast. As long ago as 1896, while making some cultures from the protozoa of another class, Calkins had noticed that the nucleus of these forms was invested in many cases by a peculiar body, at the time unknown to him. The specimen was labeled, "A Parasite in the Nucleus," and was not thought of again until he became acquainted with Councilman's specimen in the spring of 1903. The specimen was then looked up, and found to be apparently identical with the small-pox germ. Although there was about one chance in several millions that this specimen represented the exogenous phase of the small-pox organism, it was thought proper to study it thoroughly, and remove every doubt on this point. Personally, however, he believes it was a similar parasite, but not identical with the small-pox organism. In conclusion, he compared the cycle of malaria, a disease due to a protozoon, with the cycle of small-pox. Brinckerhoff, in discussing this paper, said that he had inoculated twelve apes with this organism, and in each case there had been a development of a lesion analogous to the vaccinia lesion; indeed, the disease in the monkey was found to be comparable in its clinical course, in the evolution of the lesions, and in the general constitutional reaction with variola inoculata in man. In every case in which a secondary exanthem developed, the lesion was found in that. It had been possible by this mode of experimentation to determine quite accurately the time relation between the various stages of the parasite and the evolution of the lesion, and these findings were perfectly in accord with the results obtained by Calkins on the human lesion. The monkey was subject to both vaccinia and variola, and hence this animal was particularly well suited for the final demonstration of the minute details of the complete life history of the organism of variola.

The Therapeutic Value of Injections of Antidiphtherial Serum.—L. CRUVEILHIER (Ann. de l'Inst. Pasteur, January, 1904) has made some experimental observations relative to the dosage, the repetition and the method of administration of anti-diphtherial serum. The experiments were made on guinea-pigs inoculated in one series with cultures, in a second series with the toxin; they were designed to answer the questions whether massive doses are more efficacious than mean doses, whether there is advantage in repeating doses, and what method of injection is to be preferred. The results obtained in the first series were as follows. Subcutaneous injection of 1-10 c.cm. of serum was successfully used ten hours after inoculation of the animals with a standard lethal dose of culture; the period was extended to twelve hours by the injection of massive doses and repeated doses also lengthened the period of successful injection. Intracerebral injection further lengthened the period to from twelve to fourteen hours, but intravenous injection was still more efficacious up to about sixteen hours. In the second series in which the animals were inoculated with toxin similar effects were obtained, intravenous injection being efficacious later than either subcutaneous or intracerebral. The writer concludes from his experiments that in diphtheria as in tetanus there is a period after which antitoxin is of no value administered; the injection of a primary massive dose is useful and necessary; the dose should be repeated at least in all serious cases; intracerebral injections are more efficacious than the subcutaneous, but intravenous injection is the method of choice and a most valuable therapeutic measure.

Treatment of Pleural Effusion.—ANTONIO PISANI (Gazz. Med. Ital., March 3, 1904) says rational treatment involves early and complete removal of fluid and the restoration of the pleural sac to its natural condition of a virtual rather than an actual cavity. The ordinary method of simple aspiration—as, for example, with Potain's aspirator—can hardly effect complete removal of fluid; it is apt to cause an oppressive sense of constriction of the chest, and to leave an actual cavity, which invites a return of the effusion, and is incompatible with complete recovery of function. A further disadvantage is the danger of edema of the lung. All these drawbacks are avoided by the use of Forlanini's method of pneumatic aspiration, in which sterilized air is made to take the place of the effusion. The whole of the effusion can thus be withdrawn. There is no high negative pressure in the chest to cause pain during the operation. There is little danger of relapse. After a few days the artificial pneumothorax thus produced disappears, and the patient is left without deformity and free from interference with the respiratory function. The method is particularly recommended for cases of extensive and long-standing effusion. It is described as being at least equal to the old method in simplicity and superior to it in safety. Out of a large number of cases observed by himself Pisani quotes in detail that of a child of 9 years, from whom he removed 1,600 c.cm. of fluid, which had probably been in the pleural cavity for eleven weeks. During the operation he insufflated 1,000 c.cm. of air filtered through cotton wool and slightly impregnated with formaldehyde. At the end of the operation part of the air was removed by aspiration. The striking and complete success of the treatment he attributes to the method of operation.

Little's Disease.—By DR. E. GRATZER (Vademecum der Kinderpraxis, p. 321). Little's disease is a rare affection. It is sometimes not detected until the children begin to walk; but sometimes it is noticed soon after birth. While bathing the child, the mother notices a peculiar rigidity of its body; that the child does not kick, but usually lies motionless with the legs pressed against each other, or, perhaps, one upon the other. The child attempts to walk late and with difficulty. The patient takes short rigid steps, with the feet in a tiptoe position, the knees pressed closely together; or the legs are thrown across each other and the lower parts of the legs are rotated inwards, the feet usually touching the ground with the great toes only. There is also tension of the muscles, particularly rigid contraction of the abductors of the thigh and calf-muscles, and later involvement of the upper extremities and even of the trunk. The paresis and rigidity of the lower extremities become gradually more pronounced. At first the patients are able, if supported, to move a few steps forward in a clumsy spastic paretic gait, but they soon are rendered helpless by development of fixed contractures. The patellar reflex is exaggerated. The skin of the lower extremities is often cool, somewhat cyanotic, and its sensibility is disturbed. The electromuscular contractility of the muscles and the functions of the sphincters are normal. There is usually no atrophy of the musculature. In some cases, however, atrophy (amyotrophic spinal paralysis s. lateral sclerosis) and brain symptoms (especially bulbar symptoms) are later observed. Sometimes there is defective physical development from the beginning, in other cases not until later. Not infrequently also complete idiocy, stammering, nystagmus, strabismus and convulsions are observed. Opinions differ greatly as to the real nature and anatomic changes of spastic paralysis. An alteration in the pyramidal tracts, however, seems to be the chief cause. Premature birth, difficult protracted labor with trauma during parturition, and intrauterine diseases are mentioned as exciting causes. Consanguinity of the parents was often observed, and hereditary syphilis sometimes seems to serve as a contributing cause. According to Flechsing, the pyramidal tract of the spinal cord is formed last (in the fifth to seventh fetal month); the fibers do not receive their medullary sheath until the ninth fetal month, and its complete development does not take place until the first few months of extrauterine life. It is, therefore, not at all surprising that an arrest of development often occurs in premature births; that in difficult labors with mild injuries, mild encephalitic changes, hemorrhages in the spinal cord, and injuries of the vertebral column the undeveloped tract suffers; and that in more severe injuries (intrauterine disturbances, inflammation and defective development) the brain also is involved. The prognosis of the spastic spinal paralysis is not absolutely unfavorable except when the disease is complicated by severe cerebral symptoms. Prolonged pauses, improvement and even cure are observed; even amyotrophic lateral sclerosis runs a slower course in children than in adults.

TREATMENT.—Early orthopedic measures. Galvanization of the spinal cord and the peripheral nerves; careful massage; also immobilization and passive movements; practice in gymnastics, baths, etc. Tenotomies (Achilles' tendon) if necessary.

Chorea and Taenia Solium.—By DR. J. BURNAT (Brit. Jour. of Children's Diseases, Vol. 1, No. 4). The author observed two cases of chorea which were caused by tapeworms. The first case was that of a girl seventeen years of age. When the author first saw her she was lying in bed. The movements were very violent, involving the head and face as well as the body and limbs. At times she contrived to throw herself out of bed on to the floor and had injured herself in consequence. The pulse was 128, and the respiration 32 per minute. The axillary temperature was 99.6° F. Breathing was evidently very difficult owing to spasmodic and irregular action of the respiratory muscles. When spoken to the patient made no reply. The heart was dilated, but there was no murmur audible, though great difficulty was experienced in conducting the physical examination of the patient owing to her grotesque movements. Calomel, sodium salicylate and digitalis and bromides and a milk diet proved of no value in arresting the choreic movements. The probability of worms being present was then thought of and accordingly a capsule containing Extr. filicis lig. was ordered. This resulted in the passage of a large tapeworm. From this time the patient began to improve. Within three days after the segments of the worm were passed the patient answered "yes" to questions put to her. This was the first time she had spoken since the onset of the attack. The pulse now became normal and the movements gradually became less and finally subsided. The patient made a complete recovery after three weeks. The second case, a girl of twelve years of age, when first seen by the author, was sitting on a chair making grimaces and twisting and wriggling about. She was ordered to bed and put on a milk diet. The heart was found to be dilated and the second pulmonary sound markedly accentuated. Antirheumatic remedies and large doses of arsenic proved futile. In three weeks' time the patient's condition had assumed a somewhat serious aspect. She had now become very breathless and the respirations numbered 36 per minute. The temperature had risen from normal to 101° F., while the pulse was very feeble and rapid. A capsule containing 30 minims of Extr. filicis liq. was administered, with the result that a fairly large-sized specimen of tænia solium was passed. Almost immediately the choreic movements ceased, though it was fully a fortnight before the heart recovered its tone. Both patients presented a history of rheumatism and were of distinctly neurotic temperament.

Tuberculous Rheumatism in Children.—G. Mouriquand (Gazette des Hopitaux, January 21, p. 69) reports history of a girl, aged ten, with a good family history, who was in good health until the age of eight, when her mother noticed that she walked badly, with the feet in a valgus position. There was distinct enlargement of both tibio-tarsal articulations. The condition was not painful. The hydrarthrosis of the ankle-joints was accompanied by marked swelling of the sheaths of the anterior, interior and external annular ligaments, which obliterated the natural hollows and gave the dorsum of the feet a puffy appearance. The tarsal bones were thickened so that the plantar aspect of the arch of the foot appeared enlarged. There were no acute inflammatory signs. Simultaneously the wrists became puffy, and the sheaths of the tendons on the radial side of the arm enlarged. Multiple osteophytes appeared on the phalanges. For about two months movements of the wrist were restricted, and afterwards complete ankylosis occurred. Some weeks later the effusion in the ankles and wrists diminished. But abundant effusion then occurred in the knees, which after temporary improvement soon returned to its former dimensions. There was no pain in any of the joints. About the same time synovitis of the elbows occurred. She was treated with cod-liver oil, phosphate of lime and warm saline baths and blisters. On August 23, 1903, she was admitted to hospital. The knees were symmetrically swollen and globular. The internal condyles were enlarged, so that when in apposition the internal malleoli were 4 inches apart, as in genu valgum. Over the knees were numerous dilated superficial veins. The swelling was especially marked in the synovial pouch on either side of the extensor tendon, where there was fluctuation. There was slight tenderness over the left external condyle, and the right inter-articular line. Over the right external condyle a movable body of the size of a pea was felt. Flexion of the knees beyond a right angle was painful and accompanied by crackling. Complete active extension was possible, though a position of slight flexion was habitually assumed. The muscles of the thighs and buttocks were slightly atrophied. The condition of the ankles was as described in the history. There was some degree of flat-foot, especially on the right side. The two great toes were in a position of hallux valgus. The elbows were less swollen than the knees, and there was but little intra-articular effusion. But the lower epiphysis of the humerus and the upper epiphyses of the radius and ulna were hypertrophied, and the peri-articular tissues were thickened. The forearm was held pronated, and supination was difficult. There was moderate atrophy of the muscles of the arm and forearm. The right hand formed an obtuse angle with the forearm, and was displaced towards the ulnar side. The styloid processes of the radius and ulna were prominent and enlarged. The swelling was especially marked over the anterior and posterior aspects of the wrists, and the sheaths of the radial tendons. There was complete fibrous ankylosis of both wrists, though slight passive movements, accompanied by crackling, were obtainable. The inter-phalangeal joints were enlarged, but the movements were free. There were intermittent pains in the left hip, but no restriction of movement. She was pale and emaciated. The cervical and sub-maxillary and, to a less extent, the axillary inguinal glands were enlarged to the size of peas or almonds. There was harsh respiration of the left apex, but no cough. The appetite was good. The treatment adopted was immobilization of the joints, which were painted with iodine, and exposed to the sun as much as possible, the rest of the limbs being covered with linen to prevent insolation erythema. The general condition improved, the swellings slightly diminished, and the movements of the knee-joints became somewhat freer. Poncet claims that tuberculosis, like many other infective diseases, may produce a condition resembling rheumatism. He finds that tubercle bacilli are not infrequently present (in the sputum or elsewhere) in cases of chronic rheumatism, and that this connection between tuberculosis and rheumatism is relatively common in childhood. In this case the enlargement of the lymphatic glands and the involvement of the bones appeared to be obviously tuberculous. Moreover, many cases recently published as examples of primary chronic rheumatoid arthritis in children were evidently of tuberculous origin. Thus Johanessen (Zeitsch. f. klin. Med., 1900) reported a case which closely resembled the writer's. A girl was attacked, at four, with swelling and pain in both feet, which were attributed to residence in a damp and cold room. The elbows and knees became involved, and two years later the hands were attacked. At seven she entered the hospital. The muscles of the trunk and limbs—especially the upper—were atrophied, and the movements of the joints were restricted. Eighteen months later the hips became painful. The joints became progressively more deformed, and the muscular atrophy more intense. Finally, signs of pulmonary tuberculosis appeared, and death occurred from hemoptysis. The rheumatism was due to tuberculous infection, and not, as Johanessen supposes, to exposure to damp combined with an arthritic diathesis. Tuberculous rheumatism appears to be due to tuberculous toxins, and not necessarily to bacillary infection of the joints. It may begin acutely, or may, if chronic, suddenly become acute. More often it is characterized by marked indolence both of the arthritis and the teno-synovitis. Pain is a variable symptom. If marked it may render the diagnosis between tuberculous and true rheumatism extremely difficult. But in the cases in which the most marked lesion is polyarticular hydarthrosis there is usually little or no pain. In this case hydarthrosis was the primary lesion in each joint, though the final result differed in the knees, elbows, ankles and wrists. In the first the effusion persisted, in the second it was partially absorbed, and in the third was completely replaced by fibrous tissue. Chronic teno-synovitis and slight osteitis with enlargement of the epiphyses are characteristic of tuberculous rheumatism. Local insolation, fresh air and good food may give surprisingly good results. All immovable splints, such as plaster-of-Paris, which imprison the limbs and prevent access to the sun, should be rejected.

Away from Randall's Island.—"Charities," June 11, reports that the Society for the Reformation of Juvenile Delinquents in the City of New York was incorporated in the year 1824 for the purpose of receiving and training juvenile delinquents, and since that time has had under its care about thirty thousand children, of whom nearly twenty-five per cent. have been girls.

As originally planned, the purpose of the society was to locate its house of refuge a considerable distance from the streets of the city, so that the general surroundings and outlook would inspire a love of nature, and to a degree neutralize the effects of the temptations to which the children had been subjected in the city. The growth of the city in time compelled removal from the original rural location, on what is now Madison Square, and the House of Refuge was then established (in 1839) in new quarters more commodious and secluded. This second location also became unsuitable as the growth of the city swept northward, and in 1854 the institution finally removed to the southern end of Randall's Island, where it has since continued.

When the removal to Randall's Island took place, the location was an ideal one for a small institution. The city was practically miles away, and although only thirty-seven acres were set apart, the island afforded ample space for a measure of outdoor life. The conditions have greatly changed since 1854. Randall's Island itself has changed in character, for the northern end, then fields and woodland, is now occupied by hospitals, asylums and schools. In 1854, the outlook across the river was on wooden slopes, gardens and green fields, now it is on miles of brick buildings and smoke-stacks from manufacturing plants. Then the air was pure, bearing pleasant odors of woodland and field; now it is heavy with fumes from gas plants and sewers. The growth of the city has made Randall's Island an unsuitable place for a reformatory, and this was recognized by the legislature of 1904, which by Chapter 718 of the laws of 1904 created a commission, consisting of the comptroller, the fiscal supervisor, the president of the board of managers of the Society for the Reformation of Juvenile Delinquents, the president of the State Board of Charities, and the state architect, with power to select one thousand acres of suitable lands within fifty miles of the city of New York, and to enter into contract for their conveyance to the state. This commission is also to prepare a general plan of the buildings and the improvements necessary in order to establish the new state training school, together with preliminary specifications and the estimated cost. It is also to report to the legislature of 1905, the legislation necessary to carry out the proposed removal of the House of Refuge. The object of Chapter 718 of the laws of 1904 is to prepare the way so that the eastern section of the state shall have a training school, in character, similar to the State Industrial School as it will be on its new site of twelve hundred acres, twelve miles out from Rochester. An important modification of the work of the Society for the Reformation of Juvenile Delinquents was made by Chapters 167 and 388 of the laws of 1904, which prohibit the commitment of girls to Randall's Island. The intention of these laws is to secure the commitment of boys and girls of the delinquent class to separate institutions, legislation which embodies recommendations of the State Board of Charities which have been repeatedly made for a number of years, looking to the ultimate removal of the institution to a rural and more suitable site on a large tract of land where in new buildings there will be opportunity for a proper classification and better training of the boys. The buildings now in use, all of which are of the barrack type, prevent classification, permit the association of the vicious and the comparatively innocent, and have made it impossible for the boys and girls to have the privileges essential to the development of a natural life. Yet for these buildings and their general equipment the state has expended $666,000, and the cost as measured in contaminated lives is unthinkable. Those most intimately acquainted with the work of the House of Refuge, have felt that a new environment is imperative if the inmates are to be properly trained and saved to society. The agitation in which Jacob R. Riis bore such prominent part, for the removal of the House of Refuge and its conversion into a state institution in name as well as in fact, was based upon this conviction, and upon the further fact that while public funds entirely maintain it, its control is in the hands of a self-perpetuating private corporation. Of $7,102,148.30 so far spent to carry on the work of the society only $31,886.47 has been contributed by private individuals, the state and the city having together paid the remainder. The organization of a state training school by the transfer of the House of Refuge will give the state full control of its own work, and the legislation of the present year has had this end in view. The outlook for the removal at an early date is promising, as the board of managers of the society are said to be in full accord with the movement.

The Results of Artificial Premature Labor, with Reference to the Fate of the Children so Delivered.—(Carl Alexander Lorey, "Archiv fuer Gynekologie," B. 71, H. 2, 1904).—Premature delivery was induced in 100 cases on account of deformed pelves, in 37 cases on account of maternal diseases. Of the 100 first cases 74 were born alive and 26 dead. In the first 10 days after delivery 14 died and 60 were dismissed in good health. The best results were obtained with a conjugata vera of from 8 to 10 cm., before the thirty-sixth week of pregnancy. In diseases of the mother the pregnancy is to be interrupted as soon as dangerous symptoms become noticeable. The methods used are the bougie, kolpeurynter, hysterotomy, vaginal and Cesarian section.

Babies and Hot Weather.—The Health Department of the City of Rochester, N. Y., has issued a little circular, entitled "How to take care of babies during hot weather," which is evidently meant for distribution in crowded districts of the town. It is such an excellent compilation, writes the "Medical News," that we feel we should call attention to it, since other boards of health throughout the country may wish to imitate Rochester's provident example, and they will find in this pamphlet much that is suggestive, nothing that is not eminently practical. The outside cover bears the legend, "No OTHER FOOD, not even a wet-nurse, can take the place of milk from the child's own mother." In these modern days when a trivial excuse is sometimes considered quite enough to justify the weaning of the baby and when even physicians do not seem to be sufficiently impressed with the fact that nothing can ever make up entirely for mother's milk, it is well that this item of our present-day conclusions in medicine should be brought prominently before the public for its serious consideration. Another excellent feature is found at the foot of the outside cover. In large capitals are the words, "Give the Baby Water." There was a time not so long since, when babies practically never received simple, plain water. Today it is a difficult matter to persuade some mothers that children should be given water several times a day. There are families, fortunately rare, met with in this country, in which when the child cries for a drink in hot weather it must take a meal of milk in order to obtain the drink. Streaming with perspiration, the little one is taken up from its warm bed in the summer-time, crying because it is thirsty, and instead of being given water is given milk or the breast. Somehow the custom, common enough three generations ago, of providing water for baby, has gone out, except where the modern teaching of the necessity of water has been especially insisted on. Not a few of the babies who suffer from constipation do so mainly because of the fact that not enough liquid is supplied to them to make their food sufficiently dilute so that peristalsis shall have a fair chance to move it easily. This did not mean so much when houses were warmed by fireplaces, as there was a constant draught of air from outdoors carrying a steady amount of moisture with it. Now. in steam-heated houses the necessity for water, even in winter-time, for children, is easy to understand, and in summer-time it is little less than the worst form of cruelty to deny it to them. With such good points on the care of children on the outside of the little pamphlet it is not surprising to find that the inside is full of excellent suggestions. To keep a baby well, is the first paragraph, and it consists of these short sentences: "Give it pure air day and night; give it no food but mother's milk, or that directed by physicians; when it cries or is fretful do not offer it food, but give it water; be sure that it gets enough sleep, two naps during the day at least; do not put too much clothing on it; bathe it in a tub every day; don't handle it. Let it alone." These are expanded in successive paragraphs. The necessity for having a window open in the baby's sleeping room at night and during the day, is insisted on. Then, also, the danger of overnursing or overfeeding and necessity of stopping food soon as the first symptoms of diarrhea present themselves, is urged. Regular feeding is emphasized and in capitals the expression, "FEED IT BY THE CLOCK," ought to attract sufficient attention to make readers realize its importance. Finally, feeding according to age is made a feature. The chapter closes in this wise, "Never let the bottle stand with milk in it. Never use a bottle with a long rubber tube." To our mind the most important paragraph in the book is that with regard to baby's sleep. The question of the proper sort of bed is discussed, and the use of feathers in any form, whether in pillow or in the mattress, is rejected as entirely out of place, especially in summer. Wool or cotton must, for the same reason, be considered unsuitable. The very practical suggestion is made that babies' beds should be made of excelsior covered with cheese cloth. These materials are cheap and easy to obtain, and when the mattress becomes soiled in any way, it may be thrown away and another one made without delay or cost. It is easy to understand that such a bed is at once clean and comfortable. The Rochester Board of Health, of course, is considering city life, but in country places such a mattress might be filled with corn husks or other suitable material, easy to be obtained on farms. The objection that will occur in most mothers' minds at once is that this is entirely too rough for baby and will injure its delicate skin. As a matter of fact, baby's skin will be much healthier with the opportunity for transpiration and perspiration afforded by such a mattress than by anything that presses close to its body and prevents the proper functions of the skin during the many hours that baby must pass in bed. Letting the baby alone is recommend as the best possible way to prevent its suffering from the heat, more than is absolutely inevitable. When baby is ill, the place for it is not in mother's nor nurse's arms, but in its bed. Just because it happens to be fretful is no reason at all why it should be petted and jostled by being carried. When it is well it should be allowed to lie in bed as much as possible without much clothing on, so as to enable it to exercise its limbs freely. It is surprising how early in a baby's life it learns to play, if left to its own devices. When it is to be put to sleep, if put in its bed, it will go to sleep as a rule without rocking after a short preliminary cry. Crying is not a signal for it to be made still more uncomfortable in hot weather, by being carried in nurse's arms. Crying is, as the Board of Health points out, only one form of exercise of the lungs in children, and when they are a little older they will make themselves a nuisance by still further exercising this function, but it should not be considered as something that must be stopped at all hazards. While there are many suggestions herein that might not meet with the approval of mothers of large families, the advice is simple and practical.

Appendicitis in Children.—The diagnosis of appendicitis in children is usually more difficult than in adults from the fact that one must rely largely upon objective signs and such symptoms as are obtainable from parents and nurses. J. F. Erdmann ("N. Y. Med. Journ.," March 19, 1904) has seen 29 cases in children under ten years of age during the past two years and reminds the profession that the most important diagnostic points to be relied upon are pain manifested by fitful crying and sleep, abdominal tenderness and rigidity of the right lower quadrant after the first few hours have elapsed; the absence of blood and bloody mucus in the stools, elevation of the pulse and temperature, usually more pronounced in children than in adults; tumor fixed and in the classical position if the illness is of several days' duration, and at this time a temperature characteristic of pus. Almost invariably the little patients unconsciously place their hand in the region of the appendix to ward off manipulations in this area. This latter sign he thinks is almost pathognomonic of appendicitis. Pneumonia and pleurisy of the type that is ushered in with lower intercostal pain is exceptionally difficult to exclude during the first day unless distinct chest symptoms are present. Should the pulse become very rapid and the face become anxious, appendicitis can be diagnosticated, while, if the breathing becomes accelerated, the face flushed or livid, although the abdomen be tense and distended, pneumonia is to be considered. He believes that when appendicitis is once diagnosed the patient is always in danger till the organ has been removed and hence he advises an operation in all such cases.

New Sign of Basilar Meningitis.—The early diagnosis of meningitis in children is often very difficult and usually only one or two of the many possible signs may be present. G. W. Squires ("Med. Rec.," March 26, 1904) has found that a sign, not heretofore described, has been invariably present in his cases, frequently as early as the fourth or fifth day. It is a rhythmical dilatation and contraction of the pupil and is elicited in the following way: The child's head is placed between the knees of the physician face upward with the body of the child supported on the bed or table. Gradual and forcible extension of the head upon the spinal column is then made. As the head is extended the pupils will be seen to dilate and the more extreme the extension the more marked the dilatation. Upon flexion the pupils contract so that when the chin is forcibly brought to the manubrium the pupils are well closed up. This can be repeated several times during the minute and each time the pupillary phenomenon will appear.

Acute Mastoiditis in Infants.—AUG. BROCA ("Bulletin Medicale") emphasizes the fact that in the fetus the antrum does not lie behind the auditory canal and tympanum, as in adults, but immediately above the canal. It gradually moves to the rear and reaches its proper position at the end of the second year. Furthermore, in the first few months after birth the position of the antrum to the outer surface of the mastoid process is marked on the latter by a small red spot, caused by the presence of spongy tissue interwoven with numerous blood vessels. At this age also the antrum communicates with the tympanum by a very wide aditus, it often occurs in an inflammation of the tympanum that the pus enters the antrum without perforating the membrane, it may break through mastoid process, and form subperiosteal abscess which may heal after an incision into the soft parts. Author advises not to be satisfied with this incision, as the opening of the bone at this age is very simple and can be done with a sharp curette at the spongy spot before mentioned. The lateral sinus and the facial nerve on account of their distance from the antrum are less endangered at this age than at any other time.

Prognosis in Epilepsy.—Almost all sorts of indications have been sought for in efforts to determine some ground for prognosis in this disease. WILLIAM A. TURNER ("Lancet," April 9, 1904) concludes from a study of 161 cases, that the mental features of the interparoxysmal state should be divided into four classes. The first contains those epileptics without any obvious mental impairment, the fourth, those having the highest grade of dementia. Sex has little influence upon the mental condition, but it may be stated in general terms that males are numerically more afflicted than females, 91 to 78 per cent., but that the highest degree of dementia is somewhat more common in women than in men. A family predisposition to epilepsy and insanity favors the supervention of a certain degree of mental impairment. The duration of the disease influences the mental condition to some extent. Mental activity and mental deficiency are, however, observed in cases in which the disease has lasted respectively for over twenty years and for less than five. The age at the onset of the convulsions has some influence upon the subsequent mental conditions, and the earlier the onset the less probable the persistence of a clear mind. The character of the attacks have an important relation to the mental condition, the profoundest degrees of dementia being most commonly seen when the major and minor attacks coexist. When grand mal occurs alone, mental health is as common as mental deficiency. There is a direct association between the frequency of the fits and the mental state. Fits recurring in series are accompanied by a high grade of dementia. The term "facies epileptica" is found more commonly in the higher grades of dementia, but it is occasionally observed in patients whose memory alone has been impaired. Of the 161 cases used in the preparation of this paper, the intellectually normal represented 13.6 per cent.; those with impaired memory, 31.6 per cent.; feeble minded, 25.4 per cent.; demented 29.1 per cent.

New York's New Juvenile Reformatory System.—Attention is called in a recent issue of "Charities" to a series of articles on the various New York state institutions for the reformation of delinquent boys and girls. The state of New York has taken several long steps in the provision it is making for the better classification and accommodation of this group of its wards. The legislation which makes possible these advances went into effect on June 1. The two state reformatories for children—the Rochester State Industrial School and the New York House of Refuge on Randall's Island—are old institutions, with buildings of obsolete construction, within the limits of large cities. With the erection of the new buildings of modern construction and equipment, on country sites, the boys who are committed to state reformatories will benefit by the more progressive system of accommodation and care, while the transformation of the Hudson House of Refuge for Women into a State Industrial School for Girls will give young girls of this class the great advantage of a separate institution, and one organized on approved lines. These three state schools are supplemented by the New York city school for young misdemeanants on Hart's Island. While this is one of the best features of the city Department of Correction, it is a work which the state should undertake, and which, if undertaken by the state, would complete and perfect the already admirably organized system of state care for juvenile delinquents.

PEDIATRICS

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ORIGINAL ARTICLES

SUMMER DIARRHEAS OF INFANCY AND THEIR PREVENTION*

By Victor C. Vaughan, M.D.,Ph.D., of Ann Arbor, Mich.

About one-fourth of all children born in the civilized world die before they reach five years of age.

About one-half of all deaths among infants are due to diarrheal diseases.

These diseases prevail almost exclusively during the hot months of summer, consequently they are known as the summer diarrheas.

They are confined to children that are fed wholly or in part on cow's milk. Failure of the mother to nurse her child during the first year of life greatly increases the danger of illness from the summer diarrheas.

The summer diarrheas of infancy are cases of milk poisoning. Cow's milk becomes poisonous on account of germs which get in it and multiply, producing highly poisonous substances.

The prevention of the summer diarrheas and the fearful mortality due to them consists in giving attention to the milk with which children are fed. If the cow giving the milk be healthy, and germs be kept out of the milk after it is drawn, it will not cause diarrhea. The following rules should be followed in securing and caring for milk:

1. The cows should be healthy, and the milk of any animal which seems indisposed should not be mixed with that from the perfectly healthy animals.

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*Teachers' Sanitary Bulletin.

2. Cows must not be fed upon swill, or the refuse of breweries or glucose factories, or any other fermented food.

3. Cows must not be allowed to drink stagnant water, but must have free access to pure, fresh water.

4. Cows must not be heated or worried before being milked.

5. The pasture must be free from noxious weeds, and the barn and yard must be kept clean.

6. The udder should always be washed before the milking.

7. The hands of the milker should be clean.

8. The milk should be received in a clean, scalded pail.

9. The milk must be at once thoroughly cooled. This is best done by placing the milk can in a tank of cold spring water or ice water, the water being of the same depth as the milk in the can. It would be well if the water in the tank could be kept flowing; indeed, this will be necessary unless ice water is used. The tank should be thoroughly cleaned every day to prevent bad odors. The can should remain uncovered during the cooling, and the milk should be gently stirred. The temperature should be reduced to 60 degrees F. within an hour. The can should remain in the cool water until ready for delivery.

10. In summer, when ready for delivery, the top should be placed on the can, and a cloth wet in cold water should be spread over the can, or refrigerator cans may be used; at no season should the milk be frozen, but no buyer should receive milk which has a temperature higher than 65 degrees F.

11. After the milk has been received by the consumer, it should be kept in a perfectly clean place, free from dust, at a temperature not above 50 degrees F. Milk should not be allowed to stand uncovered, even for a short time, in sleeping or living rooms. In many houses in the country and villages, and occasionally in the cities, the drain from the refrigerator leads into a cesspool or kitchen drain. This is highly dangerous; there should be no connection between the refrigerator and any receptacle of filth. The refrigerator waste should discharge in the open air.

12. The only vessels in which milk should be kept are tin, glass or porcelain. After using the vessel, it should be scalded and then, if possible, exposed to the air.

13. When ordinary market milk is used in feeding infants it should be sterilized.

14. The details of sterilization can be learned only by practical demonstration, and the family physician should be asked for instruction. Unless sterilization is scientifically carried out it is worthless.

15. A milk which has already an abundant germ growth in it cannot be made a safe food for infants by sterilization, because while the heat employed in sterilization kills the germs it does not destroy the poisons already generated by the germs.

16. After sterilization, the bottles of milk should be kept at a temperature below 50 degrees F., until one is needed for the child, when the bottle with its contents should be warmed by being held for a few minutes in water until it is brought near the temperature of the body.

17. Should an infant develop a diarrhea, discontinue the administration of milk in any form and immediately seek the advice of a competent physician.

18. The family physician alone is competent to decide what modifications should be made in cow's milk to render it a suitable food for a given child.

The Sterilization of Milk for Infants.—For those who cannot conveniently consult a physician, the following details for the sterilization of milk are given: It should be understood that only fresh milk, obtained according to the rules already given, is fit food for infants, even after sterilization. Obtain one-half dozen or more nursing bottles with suitable wire holder, kept by druggists. The bottles should be placed in a kettle of soft water, a heaping teaspoonful of the bicarbonate of soda dissolved in the water in order to render it fully alkalin, and then the bottles boiled for half an hour. After being allowed to cool,the bottles are filled with the milk, the mouths closed with clean, absorbent cotton and the bottles placed in the wire holder are set in a kettle of water, so filled that the water in the kettle is but little below the level of the milk in the bottles; then the water in the kettle is brought to the boiling point and kept at this temperature for fifteen minutes; then the wire holder with the bottles is kept in an ice chest until one of the bottles is needed to feed the child. This bottle is warmed by holding it a few minutes in lukewarm water, then the cotton is removed and a rubber nipple drawn over the mouth of the bottle. Nipples with long rubber tubes attached should NEVER be used. It is impossible to cleanse them and they have undoubtedly caused the death of many children. The nipples when not in use should be kept in a clean glass jar containing lime water, and each nipple should be dipped in boiling water just before it is attached to the nursing bottle. When the child has taken its food from a bottle, any milk remaining in the bottle should be thrown away, and the bottle boiled before it is again filled with milk. Enough bottles should be prepared each morning to last the child for twenty-four hours, one bottle for each feeding; any milk left over at the end of the twenty-four hours should be thrown away.

REMEMBER:—(1) That a milk which has already become bad cannot by any means be rendered a fit food for infants. (2) That after sterilization the milk must be kept on ice or at a temperature not above 50 degrees F. until needed by the child. (3) That tube nipples must not be used under any circumstances, and that the nipples must be kept clean and each one dipped in boiling water before it is used. The fingers with which the nipple is handled must be clean.

THE PROPHYLAXIS OF SUMMER DIARRHEA

BY J. H. MASON KNOX, JR., Ph.D., M.D.,

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So much has been written during recent years on the prevention of summer diarrhea that there seems little that can be added to the subject. The theories of the origin of this affection, as well as the suggestions to prevent its recurrence, have been many and various. However, as the knowledge of any specific ailment becomes more exact and definite the methods of prophylaxis and treatment should become more precise and successful. This has been notably the case in the conflict with tuberculosis, typhoid fever, yellow fever, and a number of other diseases in which it has been found that certain procedures adapted to the specific disease are more efficacious than a host of general measures.

The discovery made a few years ago that a large number, at least of the typical cases of summer diarrhea, are produced by infection of the alimentary canal with the Bacillus dysenteriæ, Shiga has added much interest to the study of these dangerous disorders among infants, and has led to the hope that the effort to stamp out this widespread yearly epidemic may be more intelligently, and hence more successfully, directed.

The association of the Shiga bacillus with summer diarrhea led naturally to the attempt to produce a curative serum. It was found possible to immunize animals (horses) against many times the lethal dose of the organism, and last summer at the Thomas Wilson Sanitarium and elsewhere a number of cases were injected with this immune horse serum, prepared under Dr. Flexner's direction at the Mulford Vaccine Farm.

The results obtained will be reported in more detail later. They were in the main disappointing, although the specific action of the serum seemed definite in several instances. It was demonstrated that the injection of the anti-dysentery serum under proper precautions is an absolutely harmless procedure, and it may be that hereafter a serum highly protective and curative for infants may be procured.

Work along these lines is progressing. Thus far, however, it must be acknowledged that the prevention of the disease by prophylatic measures rather than its cure by serum offers the most hopeful field in the study of summer diarrhea.

With these facts in mind it may not be without interest to analyze a series of cases treated last summer at the Thomas Wilson Sanitarium with reference to some of the factors which are thought to play an important part in the etiology of the disease. One hundred and ten cases form the basis of this report. They represent seriatim the cases of summer diarrhea treated at the Sanitarium during the season. Cases are excluded in which malnutrition or disease of other viscera than the intestinal tract played the most prominent part in the child's condition. In 43 of these instances the dysentery bacillus was found by Dr. Bassett in the dejecta. These 43 cases included all the clinical varieties of summer diarrhea, both those in which the symptoms are due to an acute toxemia, called gastro-enteritis, dyspetic or fermented diarrhea, and those in which there is evidence of a destructive lesion of the intestine, usually designated as ileo-colitis.

Realizing that there is no sharp distinction to be drawn between these two clinical divisions, of the cases here reported in our series, 87 cases belonged to the "toxic group" and 23 should more properly be considered examples of ileo-colitis.

It was thought that with sufficient laboratory facilities the dysentery organism could have been isolated in practically all of the 110 cases of the series.

It is to be emphasized that these patients came to the Sanitarium from widely-separated parts of the city of Baltimore, and that at the time of admission they were already suffering from intestinal disorder. We are not dealing, therefore, with an institutional epidemic, and an analysis of these cases represents fairly well the conditions pertaining in the families of the laboring class in our city.

The principal data can perhaps most easily be understood in tabulated form.

Age and Season.—The age of the patients in periods of six months, together with the fortnight of the summer in which they were admitted, is shown in the following table:

TABLE I.

		June		July		August	
Age	Total	1-15	15-30	1-15	15-31	1-15	15-31
0-6 months....	38	..	5	17	9	3	4
6-12 months....	45	1	3	15	18	8	..
12-18 months....	16	..	4	6	3	3	..
18-24 months....	5	..	..	1	4	..	..
24 + months....	6	..	2	4	..	..	..
Total	110	1	14	43	34	14	4

It is to be noticed that 83 of the 110 cases, or 75 per cent., were under a year old; after this time the number rapidly diminishes, and after two years the trouble rarely occurs. The oldest child in our series was three years of age.

In regard to the season in which the disease is most likely to break out, it should be recalled that last summer was exceptionally cool, and that the outbreak of diarrheal disorder among infants was therefore delayed. However, the increase in the number of cases through June to a maximum early in July, and then a gradual fall through the remainder of the summer, as shown in the table, agree with the observations of many years, and place this series, in which the dysentery bacillus is a probable casual factor, in line in this particular with clinical experience with summer diarrhea in general.

A feature of the disease not brought out in the table, but which was marked in our series, and has been generally noted for many years, is the sudden increase in the number of cases after even a short period of excessive heat.[1]

Diet and Surroundings.—The diet and the surroundings of our patients at their homes at the time of their illness is indicated in a second table. This data was obtained from the statements of each patient's mother at the Sanitarium, confirmed by her conduct while under observation, and by the reports of the town nurses employed by the Sanitarium to visit the children of the poor in the city. The following blank is filled out with every history, so that a fairly complete record of the condition amid which the child lives is secured:

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[1] Park and Holt, Archives of Pediatrics, xx, 1903, p. 906.

No........ **Ward**........

THE THOMAS WILSON SANITARIUM FOR SICK CHILDREN.

Name.................... Address........................

Age.................. Admitted.........................

Diagnosis ....

Result ....

Family History: Mother. F.

B. S.

Number living in room with baby, and size of room.

General household hygiene.

Other diarrheal cases in household.

Past History:

Manner of birth.

Previous diseases.

Number and character of stools before present illness.

Nourishment:

A. Breast-fed exclusively.
  a. Until what age.
  b. Intervals between feeding.
  c. Length of feedings.
B. Mixed feedings, breast + ?
  a. At what age begun.
  b. Intervals between feedings.
C. Artificial feeding.
  a. Milk, whole.
  b. Diluted with?
  c. Quantity per feeding.
  d. Intervals between feedings.
  e. Source of milk supply (name and address of dealer).
  f. Refrigeration at home.
  g. Pasteurized, etc.
D. Proprietary and other foods.
E. 1. Lime water, soda or potash solutions.
  2. Can sugar. Milk sugar.
F. Water given *with* nourishment, boiled, unboiled.
  Water given *between* feedings, boiled, unboiled.

A word or two in explanation of Table II. may be helpful. In the breast-fed cases no other milk or fluid other than water was given. Three of them were occasionally given dry bread or a cracker in addition to the breast. By "fair" cow's milk is meant obtained from milk wagons or dairies. "Store" milk is the milk purchased at the small grocery stores and elsewhere. This milk is usually cheaper, particularly rich in bacteria, and often adulterated. (See articles by the writer and Bassett, *Maryland Medical Journal,* Vol. XV., 1902, p. 240, and Schorer, *ibid.,* Vol. XVI., 1903, p. 214.)

In most homes "heating the milk" means "bringing it to a boil" or "scalding" it in an open vessel on the stove. Definite sterilization or Pasteurization was not practiced. The amount of care the patient received and the conditions of life at the home, amount of fresh air and sunlight are grouped together under the caption "Hygiene." The cases were then roughly divided into three classes, according as in our judgment the hygienic surroundings seemed good, fair or bad.

In no instance were these conditions ideal. The unboiled water referred to in the table comes in nearly every case directly from the city mains. The question of refrigeration explains itself.

TABLE II.

		Hygiene			Water			Refrigeration	
	Total	Good	Fair	Bad	Boiled	Unboiled	Not given	Ice	No ice
Breast milk	11	4	4	3	..	7	4	1	1
Cow's milk, "fair," heated	23	9	11	3	4	17	2	13	7
Cow's milk, "fair," raw	9	2	5	2	..	7	2	1	5
Cow's milk, "store," heated	28	1	6	11	5	8	5	4	13
Cow's milk, "store," raw	8	1	4	2	..	7	1	..	7
Condensed milk	29	9	11	9	6	21	2	1	8
Table diet	12	3	6	3	..	12	..	..	7
Total	110	30	47	33	15	79	16	20	57

There are several facts brought out in this table which differ somewhat from the generally accepted views concerning the method of infection of summer diarrhea.

The number of breast-fed children suffering from intestinal disorders, 10 per cent. of the whole number,[2] is larger than is usually given. Moreover, it is surprising that the infants fed on milk of an inferior quality purchased at the small stores should not far outnumber those given fairly good milk or condensed milk. In our series they were nearly equal, being 32, 36 and 29, respectively.

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[2] In a series of 62 cases of infection with the dysentery bacillus, recently reported, 14 or 22 per cent. were breast-fed. (Le Fetra and Howland, *Medical News.*

This is in part explained by the fact that a larger proportion of the mothers who were sufficiently intelligent to supply milk of fair quality to their children were also more willing to avail themselves of the benefits of a distant sanitarium when their babies became ill than were the less intelligent who used the "store" milk.

A surprisingly large number of the mothers heated, that is, scalded, the milk before giving it to their children.

The table gives no indication of the great irregularity of feeding, as well as of the lack of any relationship between the strength of the milk mixtures and the quantity given at a time, and the age and size of the baby. These dietary misdemeanors are constantly committed in the homes of the poor, and often set up digestive disturbances and lower the resistance of the child to subsequent infection. That the number of our cases who lived under fair hygienic surroundings is large is to be also partly accounted for by the fact that a considerable proportion of our patients belonged to the more intelligent of the working classes.

Notwithstanding these facts, the many babies who have been admitted to the Sanitarium from moderately-cleanly homes and who have received boiled or scalded milk has been of especial interest to us for several years.

It will be remembered that the cases occur simultaneously in the summer in infants who obtain their milk from absolutely separated herds, so that there can be no question of a commonly contaminated milk supply. Moreover, the number of breast-fed babies and the 29 cases given condensed milk in our series are difficult to account for on the theory that the infection is primarily one of the milk supply.

A careful examination of our histories shows that there is very rarely a previously-ill diarrheal case in the family. There were but five such in 110 cases. The usual account of the mother is that the baby, apparently well or possibly fretful for a few days, was suddenly seized with vomiting, followed by diarrhea, often associated with fever. The older members of the family remain well.

A study of the epidemiology as well as the clinical features of the affection suggests that the disease is brought about by some *common carrier*. It is certainly not carried to any great extent through the air, as it does not spread readily in hospitals and in crowded districts from patient to patient when simple precautions are taken. For some time we have had our attention directed to the *water* given the infants either with or between their nourishments as a possible means of conveying the disease. If it is accepted that many of these cases are produced by the dysentery bacillus, there are certain biological facts that would tend to support this hypothesis. The dysentery bacillus belongs to the same group of bacteria as the typhoid and colon bacilli. These find entrance to the body chiefly through drinking water. It has been shown that all these organisms may live for indefinite periods in water, and may even survive the ice of winter, and that they multiply rapidly in warm weather.

Thus far the Shiga bacillus has not been certainly isolated from drinking water. This, however, is rarely done in the case of the typhoid bacillus, the demonstration of the colon bacillus in water being taken as an indication of the probability of its infection by the typhoid bacillus. May it not indicate also the possibility of its contamination by the dysentery bacillus, particularly in warm weather when there is a widespread epidemic in progress? With this possibility in mind, the 110 cases in our series were investigated to discover in how great a proportion *all* the water given the babies had been boiled and the bacteria therefore destroyed. The results of this study are seen in the second portion of the table. Thus of the 110 cases, in 15, or 13.6 per cent., the mothers asserted that all the water given the child had been boiled; in 16 cases it was claimed that no water was given other than with the milk, but in three of these instances the milk itself was fed raw; so that there are but 13 babies, or 12.8 per cent., who, according to the statement of their mothers, received no unboiled water. On the other hand, there was testimony that 79 infants, or 71.8 *per cent. of the whole number*, were given *unboiled water* from the city mains either with or between the regular feedings. It is especially noteworthy that unboiled water was given to 7 of the 11 breast-fed cases, and to 21 of the 29 babies fed on condensed milk. In these two groups infection through the milk supply can be practically disregarded. Of the 15 babies stated to receive only boiled water, and of the 16 infants to whom no water was given, further investigation shows that eight lived in very bad surroundings, and that eight were given various articles from the table besides the regular diet. These facts, as far as they go, tend to substantiate the hypothesis that the yearly outbreak of diarrheal diseases prevalent among infants may be in part water-borne. The infection of this common carrier would explain the simultaneous outbreak of the disorder in distant parts of a city.

It may be found in the future that the dysentery bacillus is a constant inhabitant of the intestinal tract, but very painstaking and repeated examination of normal stools have thus far failed to demonstrate it. Sporadic cases of intestinal disorders due to the same organism have been shown to occur among children and adults from time to time through the winter. These would suffice to perpetuate the life of the bacillus.

A certain number of the diarrheal diseases in infants are unquestionably due to other organisms, notably the streptococcus pyogenes. The relationship, if any, of water to these cases is still unknown. It must be recognized that there are other modes of infection. Several cases have come under observation where direct contact with fomites or insects, notably the housefly, seems to have carried the disease.

Data concerning the refrigeration in the homes of our patients were obtained in 77 instances. In 20 of these it was claimed that ice was taken regularly throughout the summer. This fact further confirms the statement that many of our cases come from the better classes among the poor.

The results of the treatment in the series of cases have been arranged in the following tables. No marked difference in susceptibility or resistance to the infection was noticed in the different races which came under observation. There were seven colored infants in the series:

TABLE III.

		Result			
Age	Total	Well	Improved	Unimproved	Died
0-6 months	38	18	12	1	7
6-12 months	45	13	20	1	11
12-18 months	16	12	3	..	1
18-24 months	5	2	3	..	..
24 + months	6	4	2	..	..
Total	110	49	40	2	19

These figures indicate the remarkable limitation of the mortality from the disease to the first year of life, the death-rate in the first six months being 18 per cent., in the second 24 per cent., and in the third but one-half per cent. in our series, while no fatalities occurred after eighteen months.

It would appear, then, in early infancy, when the digestion is so often disturbed by nutriment ill-suited in quality and quantity to the delicate alimentary tract, that the child is most susceptible to diarrheal disorders during the summer; that these illnesses usually result favorably in children over a year and a half, but are attended throughout the first year by a considerable mortality.

The results in reference to the diet have also been tabulated:

TABLE IV.

		Result			
	Total	Well	Improved	Unimproved	Died
Breast milk	11	4	6	..	1
Cow's milk, "fair," heated	23	12	9	1	1
Cow's milk, "fair," raw	9	2	2	..	5
Cow's milk, "store," heated	18	12	4	..	2
Cow's milk, 'store," raw	8	4	3	..	1
Condensed milk	29	7	12	1	9
Table diet	12	8	4	..	..
Total	110	49	40	2	19

The cases in the individual groups, particularly those receiving raw milk, were too few to admit of any general deduction. However, in taking all the infants together who received cow's milk, both of fair and bad quality, either heated or raw, as compared with those fed on condensed milk, certain suggestive data are obtained.

There were in the series of 110 cases 58 infants who were fed on cow's milk, usually improperly modified. Of these, 30 recovered, 18 improved, 1 was discharged unimproved, and 9 died, a mortality of 10.5 per cent.—*i. e.,* 82.7 per cent. of the number were bettered and 17.2 per cent. did badly; whereas of the 29 cases brought up exclusively on condensed milk, 19, or 65.5 per cent., were bettered, and 10, or 34.4 per cent. became worse, the mortality being 31 per cent. This would emphasize the truth, long known, that although condensed milk and proprietary foods do not of themselves directly bring on these specific diarrheal disorders—in fact, the babies so nourished are less liable to contract them—that when infection through some other means takes place, the child reared on condensed milk has less resisting power.

The prognosis in the breast-fed infants is especially good, as it is in children old enough to take table diet.

A study of these cases would tend to lay stress on the following points:

1. There is no satisfactory substitute for mother's milk, particularly for the children of the poor.

2. When artificial feeding is necessary it is important that there should be some modification of the strength and quantity of the milk suitable to the age of the infant, that indigestion may be prevented, which implies a lowered resistance to all infections, particularly those through the alimentary tract.

3. There is reason to believe that unboiled water may play a part in the spread of summer diarrheas, and it is desirable that all water given to an infant in hot weather, either with or between its feedings, be boiled.

4. A pure milk should be accessible at a low price to the poor of all large communities. This milk should be sterilized during the summer months.

5. A diet consisting exclusively of condensed milk prevents the proper development of the child and lessens its resistance to untoward influences.

6. Life amid unhygienic surroundings has a marked deleterious effect upon the health of an infant.

THE FIRST INTERNATIONAL CONGRESS OF SCHOOL HYGIENE (NURNBERG)*

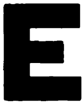
By R. T. Williamson, M.D., F.R.C.P.

The first International Congress on School Hygiene met in Nürnburg (Bavaria) on the 4th of April.[1] The Congress was under the patronage of His Royal Highness Dr. Prince Ludwig Ferdinand of Bavaria, who is qualified as a Doctor of Medicine. The President was Professor Griesbach, M.D., whose work on the estimation of brain fatigue, by the use of the æsthesiometer is well known.

The Congress was opened by His Royal Highness Dr. Prince Ludwig Ferdinand, and addresses were delivered by delegates from almost all civilized countries. About 1,400 medical men, teachers and others interested in school hygiene attended the Congress. There were eleven sections, and 180 papers and addresses were contributed.

After the congratulatory addresses, which occupied about two hours, came the first and most important paper of the Congress, by Professor Cohn, of Breslau, the subject being, "What Have Ophthalmic Surgeons Done for School Hygiene, and What Remains for Them to Do?"

For forty years Professor Cohn has worked steadily at the relation of school work to failure of vision, and his results are of the greatest value. His lecture was illustrated by many beautiful diagrams and models. Cohn believes that school work improperly conducted is an important factor in the causation of short-sight or myopia. As a test for vision Cohn employs the following letter:—



A test letter of this size should be seen with each eye separately at a distance of six meters. It may be used for testing the vision of children and of illiterate persons. The latter is turned in various positions, and the person whose vision is being tested indicates the position of the letter with a fork which has three broad, short prongs, resembling the transverse limbs of the letter. From his examinations of the vision of 10,000 school children he has drawn the following conclusions:—

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* Report read at a meeting of the Manchester and Salford Sanitary Association, April 26, 1904.—*Medical Chronicle.*

[1] The writer had the pleasure of attending the Congress as a delegate from the Victoria University of Manchester and the Manchester and Salford Association.

1. The number of short-sighted children increased the more advanced the school. In village schools the percentage of cases of myopia was 1, in elementary schools 6, in the middle schools 10, in the advanced schools (gymnasien) 26.

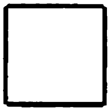
2. The number of cases of short-sight increased steadily in all schools, from the lowest to the highest class.

3. The average of the degree of myopia increased from class to class.

In Germany Cohn found that the percentage of myopic scholars, in the classes of 24 advanced schools (gymnasien), rose from 22 in the lowest class to 58 in the highest. Cohn's recent examination of students in Breslau showed that 60 per cent. were short-sighted.

The exact primary cause of myopia is still unknown; but the defect is undoubtedly increased by eye-strain, caused through prolonged work near to the eye, by hereditary tendency, and by the deficient lighting of rooms. One very important cause of myopia is the eye-strain produced during school life through the small type of books. Cohn has carefully studied the type and mode of printing school books which is desirable, in order that eye-strain and myopia may be prevented or diminished. The following are his conclusions: The height of the smallest n (this letter being taken for measurement) should not be less than 1.5mm., the least distance between two lines of print 2.5mm., the thickness of the stroke of a letter not less than 0.3mm., the greatest length of the line 100mm., and the greatest number of letters in one line 60.

Cohn recommends the following simple method of determining whether the printing of any book or paper is of the satisfactory character described: In the middle of a thin card (or visiting card) a square hole is cut, each side of which measures exactly one centimeter.



Size of hole: square centimeter.

The card with the centimeter square hole is placed on a page of the book or paper to be tested, the lower edge of the square being immediately above a line of print. If the type be satisfactory only *two* lines of print can be seen within the centimeter square. According to Cohn, the type of all books should be condemned in which more than two lines are visible in the centimeter square, measured in the manner just described. The print of many books and papers is so small that three or four lines are visible in the centimeter square. In maps the letters are often exceedingly small (0.6 to 0.5mm. in height), and hence great eye-strain is produced. Cohn draws attention to the bad effect on the eyes of the highly glazed paper, now so frequently employed, especially in American books. The printed letters should be deep black. Letters of a faint or faded black color are more difficult to read than those printed deep black.

Professor Cohn then considered the lighting of school rooms, and pointed out the necessity for attention to this question in order to diminish the risk of myopia developing amongst school children. He described the methods of examination of the lighting of school rooms. It is necessary to ascertain in the case of every scholar whether he can see writing at a distance of 33cm. whilst seated at his desk. As regards the *windows* of the school room, there are many points which require attention. The lower border should not be less than one meter from the floor. Cohn thinks that windows facing the east or southeast give the best light, but if the direct rays of the sun should be too powerful, suitable curtains or shades will be required. Förster recommends windows facing the north in order that the use of curtains or shades may be avoided. The height of the buildings opposite the school is important; if they should be too high the school rooms are made dark. Cohn thinks the total window surface should be ***at least*** one-fifth of the floor area. The higher the windows the better. The scholars should sit so that the light comes from their ***left*** side. The light of a school room is measured most accurately by means of Weber's photometer. It is also desirable to ascertain how many of the scholars, when seated at their desks, are ***unable*** to see the sky through the windows. Cohn thinks that the desks in all parts of the school room at which the sky cannot be seen should be condemned. In France, Javal has recommended that every scholar should be able to see, through the window, a portion of the sky which corresponds to a point, at least, 30cm. from the upper border of the window. This is easily determined by fixing a strip of paper on the window, 30cm. from its upper end, and then noting from which desk seats in the school room the portion of the sky seen through the window does ***not extend*** beyond this strip of paper. All seats beyond this limit (*i. e.*, in which less of the sky is seen) are unsatisfactory.

Cohn has constructed a special apparatus for testing the lighting of school rooms. In a well-lighted room small figures can be read at a distance of 40cm. without difficulty, and the rapidity with which they are read is of importance. Cohn's apparatus is based on the rapidity with which figures are read, at different parts of the room, when light is cut off to varying degrees.

The apparatus consists of a wooden eye-piece, A, which is held before the eyes like a stereoscope. Behind this are three vertical pieces of grey glass, G_1, G_2, G_3, which can be removed from their position in front of the eyes (as in G_3). The light-absorbing power of these glasses has been determined photometrically. On a horizontal bar, M_1, M_2, is a movable block, E, to which is fixed a table of 12 vertical rows of figures (F). Close by the window, on a clear day at noon, these figures can be read correctly and easily at a distance of 40cm. by the normal eye, the glasses being removed. The medical man asks the scholar to read as rapidly as possible, and with a watch the time is noted. The figures on the chart are all double, as 24, 36, etc. At least *20 figures* should be read in *30 seconds*. In a room lighted artificially, if 20 figures can be read in the manner described in 30 seconds. the lighting is satisfactory. In daylight the examination is made in the following manner: All three of the grey glasses are placed in front of the eye-piece. The scholar closes his eyes for two minutes, in order to become accustomed to the darkness, and then opens the eyes and attempts to read the figures through the grey glasses. If the light is very bright the scholar is able to read the figures through the three glasses almost as rapidly as when the apparatus is used without the glasses. The three glasses together absorb about 99 per cent. of the light, and thus the illumination is only $^1/_{100}$th part of the daylight. The lighting is *excellent* in those parts of the room in which the figures can be read easily through all three glasses. Where the scholar cannot read so many figures with the three glasses before the eyes as without the glasses, then an examination is made with two glasses only in front of the eyes. These two glasses absorb 95 per cent. of the daylight. If the scholar can read easily as many figures with the two glasses as without the glasses, the lighting of that part of the room is *good.* If this is not possible, then an examination is made with only one glass before the eyes. This absorbs 80 per cent. of the light (*i. e.,* only one-fifth of the daylight is transmitted). If as many figures are read in half a minute with the one grey glass in front of the eyes, as without the glass, the part of the room examined is satisfactorily lighted. But if this is not possible (the distance of the figures being 40cm. from the eyes) then the part of the room examined is insufficiently lighted, since the daylight often sinks to one-fifth in a few minutes owing to dark clouds. In examining the lighting of a school room (by daylight) the medical man proceeds with Cohn's apparatus slowly from the window until he is *no longer* able to read 20 figures in 30 seconds at a distance of 40cm. with three, with two glasses, with one glass in front of the eyes, and finally without glass. The different portions of the room are marked on the ground plan as excellent, good, satisfactory and unsatisfactory, according to the results of examination just mentioned.

To recapitulate, by the use of Cohn's apparatus the following questions must be answered:—

1. How many figures are read in half a minute, by the window, without any of the grey glasses in front of the eyes?

2. How far from the window are so many figures read through three grey glasses placed in front of the eyes? (Only 1 per cent. of the daylight passes through these glasses). In the ground plan of the room such places are marked as "excellent illumination."

3. How far from the window are the same number of figures read through two grey glasses? (Only 5 per cent. of the daylight passes through the two glasses). In the ground plan of the room such places are marked as "good illumination."

4. How far from the window are the same number of figures read through one glass only? (20 per cent. of the daylight passes through one glass). In the ground plan of the room such places are marked as "satisfactory illumination."

5. In what parts of the room are the figures read only ***without*** the grey glasses? Such parts of the room are marked as "*unsatisfactory.*"

[Further details of the examination of the lighting of school rooms are given by Cohn in his small pamphlet, "Wie soll der gewissenhafte Schularzt die Tagesbeleuchtung in den Klassenzimmern prüfen?" Berlin: Oscar Coblentz, 1901.]

Cohn advises that every case of defective vision among school children should be sent for further examination to an ophthalmic surgeon. He also drew attention to the risk of defects of vision being produced or increased at home, in the time devoted to home lessons, by the same causes which act injuriously at school. Finally, Cohn advocated the inspection of all schools by special ophthalmic surgeons, and concluded his address with the words: "Keine Schule ohne Augenarzt." (No school without eye specialist.)

Professor Hueppe (Prague) gave an address on the "Prevention of Infectious Diseases in Schools." Small-pox did not require consideration, because in Germany it had been practically stamped out by vaccination. In the case of whooping cough and measles, greater care should be paid to the closure of the schools, and to the isolation of the affected children. It is important also that the number of pupils in one class should not be too great—not more than 50. Mumps and chicken-pox are easily controlled by rigid isolation. In diphtheria and scarlet fever the duration of the risk of infection is very long. The disinfection of the school is usually unnecessary if the school rooms are thoroughly cleaned daily. Cleanliness very greatly diminishes the risk of infection in tuberculosis. Tuberculous disease in the teacher is far more dangerous than in the scholar, as regards the risk of infection. The prophylactic value of holiday colonies is capable of further development.

Professor Axel v. Johannessen (Christiana, Norway) gave an address on the "Development and Position of School Hygiene in Norway." He gave an account of the school sports, and of the feeding of poor school children in Norway. Human physiology, hygiene and school hygiene are included amongst the subjects taught in schools in Norway.

Dr. Le Gendre (Paris) spoke of the relation between "Scholars and Teachers, with Regard to Infectious Diseases and Moral Influence." He considers that schools present favorable conditions for the transmission of the infection of tuberculous disease. The impure atmosphere of the crowded classes, the overstraining of the organs of respiration and speech, the fatigue through the long hours of tuition, and, in many cases, the insufficient food owing to the low salaries, all increase the susceptibility of the teacher to tuberculous disease. In the case of the scholars, the miserable homes in the large towns, and hereditary tendency play an important part in the development of tuberculous disease. The risk of infection between teacher and scholar is the same as between all tuberculous cases in close association with non-tuberculous individuals. But in the close school rooms, the abundance of dust, brought in from the street, and the large number of pupils in the school room, increase the risk of infection. Also there is the risk of infection from tuberculous sputum by the common use of objects, which may be placed in the mouth, as pencils and pens, or through the wetting or smearing of the slates or books, with tuberculous saliva. In order to prevent the spread of tuberculous disease in schools Le Gendre attaches importance to the diminution of the number of scholars in one class room, to better ventilation, and to the avoidance of the appointment of tuberculous teachers. Tuberculous teachers should be sent at once to suitable sanitoria.

Professor Lieberman (Buda Pest) gave an address on the "Work and Training of the School Doctor." One of the most important means of diffusing hygienic knowledge is instruction in hygiene in schools, and the school doctor should teach it in the school. He should also give advice with reference to the plan and methods of teaching, in order that mental overstrain may be avoided. In addition to general medical training, a school doctor should have had special training in hygiene and in the science of education, and should be able to furnish a special certificate thereof.

[Professor Schuschny, of Buda Pest, states that since the year 1885, courses in school hygiene for medical men have been given every year in Hungary, in Buda Pest and Klausenburg. These courses are of three months' duration; examinations are held in the subject, and a special diploma is given. Medical men must now possess this diploma before obtaining an appointment as school doctor. In 1887 the first school doctor was appointed in Hungary. It is the duty of the school doctor to make a detailed medical examination of the scholars, to examine the vision and hearing, and to report the results of his examination. The school doctor is a member of the teaching body, and he gives instruction in hygiene in the highest classes. It is found that these classes are very popular with the scholars. It is worthy of note that in all schools in Hungary, also in all the faculties of the Hungarian universities, in technical high schools, and in training colleges for clergymen and school teachers, instruction is given in hygiene.]

Professor Schuschny, of Buda Pest, considered "Sexual Questions in Relation to School Life." For ten years he had given addresses to youths who were leaving school, on sexual hygiene, on the dangers of venereal disease and on the advantages of chastity.

Dr. Clement Dukes, of Rugby, read a paper on the "Organization of Physical Education." The physical development of the body is of importance for the mental development, and Dr. Dukes is of opinion that school games are important in the education of boys, and that such games should be made compulsory on all boys. He was not in favor of Swedish exercises, except in certain cases. Excessive exercise was, however, as bad as deficient exercise, and tended to stunt the body.

Dr. James Kerr, of London, gave an interesting address on "School Ventilation." He pointed out the advantages of the mechanical system of ventilation, as tested by the amount of carbonic acid gas and other impurities in the atmosphere. Charts were shown demonstrating the advantages, in this respect, of mechanical over natural ventilation. The inlets of air to the rooms should be high on the wall, the outlets low; 2,000 cubic feet per hour should be the amount of air for each scholar. The air should be moistened. Accessory heating by low pressure steam or water was advisable. Dr. Kerr pointed out objections to the mechanical system, and considers that the most suitable system of ventilation in the future will be a combined mechanical method of propulsion and extraction by fans, along with ventilation by means of doors and windows. The lecture was illustrated by many useful diagrams shown by lantern demonstration.

Dr. Hintzmann (Elberfield) read a paper on the "Advantage of Having the Afternoons Free from School Work." He thinks that in all of the higher schools, teachers and scholars suffer from mental over-strain, owing to the number of subjects of study, to the large number of hours devoted to school work, and to home lessons. To diminish this over-strain, he proposes an arrangement of school work so that the home lessons may be done in the afternoon instead of the evening. He suggests that all school teaching, with the exception of gymnastics and sports, should be in the morning. He proposes that 5½ hours should be devoted to morning teaching. In this time six lessons should be given, each lesson being of 45 minutes' duration instead of one hour. He would allow an interval of 10 minutes between each lesson.

Dr. Bende (Berlin) pleaded for several afternoons in the week free from school work, in order that this time might be given to gymnastic exercise, sport and play. He also pleaded for Sundays free from school work, and considered several other questions of interest only with regard to German educational systems.

Professor Dr. Schwend (Stuttgart) suggested the omission of many portions and sections of the various subjects usually taught in school.

Professor Leubuscher delivered an eloquent address on "The Duty of the State with Respect to Medical Inspection of Schools." He considers the medical inspection of schools to be the best means of preventing or diminishing the impairment of health, which may be caused by school work. Since the State has made school attendance compulsory, it is its duty to appoint school doctors for all schools—high, middle and elementary schools—both in towns and villages. The interest of the State in the medical inspection of schools is not limited to the improvement of the hygienic conditions of school children. Medical inspection of schools will also furnish information as to the relation between the dwelling houses; the industries and feeding of the population. and the diseases of school children. The medical inspection of schools will lead to improvement in school hygiene and in the hygiene of teaching.

Professor Axel Hertel (Copenhagen) read a paper on "Co-Education in the Higher School." He drew attention to the greater liability of girls to impairment of health during school life. In Denmark, in a period of thirteen years, the percentage of school boys who suffered from illness was 31, the percentage of school girls 50. The much greater tendency of girls to suffer from illness was chiefly owing to anæmia and nervous diseases. This fact should be kept in mind in the arrangement of school work. Either certain subjects of study should be omitted from the curriculum for school girls, or if girls are required to pass the same examinations as boys, a year longer should be allowed for the preparation for such examinations.

Professor Palmberg (Helsinfors, Finnland) discussed the question of the advisability of the co-education of male and female students, *i. e.,* the advisability of females attending the courses of higher education in colleges and universities. In Finnland female students were admitted to the University in 1890-91. The number of female students has steadily increased, and is now 25 per cent. of the total number on the register. This increase of the number of female students has been associated with a gradual diminution of the standard which they have attained at the examinations. More than half of the female students discontinue their studies *immediately* after passing the university examination. The other half, with the exception of 12 per cent., *gradually* discontinue their studies. He thinks the examination certificates are obtained at too great a cost, with great strain, and with perhaps an impairment of health for the rest of life. The public health of the nation demands, above all, strong and healthy mothers. In Finnland about 85 per cent. of all females marry. Hence he thinks it is not right that, on account of the 15 per cent. who do not marry, the other 85 per cent. of females should be distracted from their future duties in life by abstract studies. He suggests a female faculty in the universities. The principal subjects of this faculty should be hygiene, the care of children, the education of children, nursing of the sick, and subjects connected with housekeeping and bookkeeping.

Professor F. Erismann (Zürich) discussed the best position of the windows of school rooms with reference to sunlight. He considers it undesirable that a school room should be lighted by direct rays of sunlight passing through the windows. A diffuse daylight is preferable, and therefore the windows of a school room should be so placed that the light comes from the north—direct north, northeast or northwest.

Dr. Altschul (Prague) discussed the methods which have been employed for determining the degree of brain fatigue, by mental work (calculations, tests of memory, attention, etc.), by the ergograph and by the æthesiometer. He considers that none of these methods are free from objections. He does not regard the very extensive work which has been carried out by these methods as useless, but he considers that the results cannot be regarded as a satisfactory indication of the degree of brain fatigue. He suggested that physicians and school teachers should form an international committee for the reconsideration of the whole of brain fatigue produced by various forms of school work.

Professor Griesbach replied to this criticism. His observations on brain fatigue are well known. He believes that he has demonstrated that brain fatigue causes slight diminution of the tactile sensibility of the skin, that this diminished sensibility can be shown by the æsthesiometer, and that the results of measurements made by the æsthesiometer are a reliable indication of the degree of brain fatigue after various kinds of intellectual work. Griesbach brought forward the results of a large number of observations in support of his method, and to the writer of these notes it does not appear that the severe criticism of Dr. Altschul was scarcely justifiable.

Dr. Vannod, of Bern, followed with a very elaborate paper on "Brain Fatigue," which was illustrated by numerous charts and diagrams. He concluded: (1) That intellectual fatigue causes a diminution of the perception of cutaneous sensibility. (2) That the method of Griesbach (examination with the æsthesiometer) is a simple and reliable method of detecting modifications of the cutaneous sensibility. (3) That certain factors act directly or indirectly on the sensibility, and ought to be taken into consideration in observations by this method. These factors are the surrounding temperature, the state of health of the scholar who is the subject of examination (neurasthenia, fatigue from insufficient sleep, nervousness), and the capacity of the scholar for various branches of instruction. (4) That it is desirable that the results of observations should be generalized, and that in town schools physicians and teachers should simultaneously make examinations of the sensibility with the æsthesiometer, in order that a collection of observations may be obtained, which will show the value of the æsthesiometric method.

Professor Sakaki Yasusaburo (Tokio, Japan,) read a paper, in German, on the results of "The Measurement of Brain Fatigue in Four Schools in Japan." He had employed Griesbach's method.

Dr. Neuburger (Nürnburg) urged the necessity for examination of school books with respect to type. Cohn's rules (already given in this report) should be accepted.

Professors Blasius and Wernicke (Brunswick) urged the desirability of instruction in hygiene for all teachers, and of its inclusion amongst the compulsory subjects for teachers' examinations in the future.

Professor Wernicke (Posen) urged the importance of instruction in hygiene in schools and in training colleges for teachers.

Dr. F. G. Schmidt (Bonn) advocated the erection of school baths in connection with the school house, and the teaching of swimming. In the discussion following this paper a lady (whose name I did not hear) strongly urged the importance of medical supervision of school children with respect to bathing, since, in her opinion, it had an injurious effect on some school girls.

Dr. Leslie Mackenzie (Edinburgh) read a paper on the "Medical Inspection of Schools and School Children in Scotland." From the statistics which he produced in his address, it is worthy of note that there are over 14,000 children attending school in Scotland under the age of five years.

Dr. G. E. Shuttleworth (London) read a paper on the "Education of Epileptic Children."

Many other papers of importance were read, but in this report only those have been referred to which were of most interest to the writer, and as the contributions were so numerous (180) limited space only permits a reference to a minority of them.

SCHOOL WORK IN NÜRNBERG

School attendance is compulsory at the end of the sixth year of life. In the elementary schools there are seven classes—the lowest class named 1st, the highest the 7th. The number of school hours weekly, both for boys and girls, is as follows: In the 1st (lowest) class, 20; in the 2d and 3d, 26. In the other classes, for boys, 4th, 29 hours; 5th, 30; 6th and 7th, 31; for girls, in 4th to 7th classes, 30 hours.

The school desk commonly used is Rettig's desk. This desk has a raised foot-rest and a back-rest; it can be turned up on end when cleaning of the room is necessary.

The printing of the school books has received consideration, and in the future only those books will be allowed in which the type fulfils the requirements of Cohn, already mentioned.

School begins in winter and summer, in classes 2 to 7, at 8 A. M., except in December and January, when it commences at 8.15. In the 1st class (lowest) it begins at 9. In class 1 (elementary) the school hours are from 9 to 11 A. M.; and from 2 to 4 P. M. In the other classes, 2d to 7th, the hours are from 8 to 11 or 12, and from 2 to 4. The following are the intervals of rest or play during school work: At 9 o'clock, 5 minutes; at 10 o'clock, 15 minutes; at 11 o'clock, 10 minutes; at 3 o'clock, 10 minutes. On Wednesday and Saturday afternoons there is no school attendance; but the scholars attend school on Saturday mornings. The work in the afternoon is chiefly of a light nature, such as drawing, writing and handwork.

Most of the schools are beautifully constructed and are models of cleanliness. In each class room the *length, breadth* and *floor spaces* are given in large figures on one side of the room. The average number of boys in one class during the last ten years has been 51, the average number of girls 38. The floor space of the class room is usually over 60 square meters, and the height 3.5 to 4 meters. Most schools have an excellent gymnasium and a beautiful large lecture room.

In Nürnberg there are fifteen medical school inspectors. All new scholars are examined medically within the first fourteen days after entering school. (If the physical and mental development is unsatisfactory, the commencement of school work is postponed for one year.) A second complete medical examination is made within the first six months, and the results given in a health certificate. The parents are invited to be present at the examinations. The third examination, in which vision and hearing are tested, is made in the last quarter of the first school year.

The general hygienic condition of the school is under the supervision of the school doctor, who is also expected to attend the meeting of the School Board or committee of management, of which he is a member. He has the right of voting on various questions. The school doctor visits each school in his district at least three times in the year. In addition to the systematic examinations already mentioned, medical examination is required on other occasions—when infectious disease is suspected, when school work has been postponed, etc. In the cases of boys, in the last three months of school attendance, if the parents desire it, the school doctor makes a final medical examination in order to give advice as to the occupations in life for which the boy is suitable, in view of his physical condition.

A full account of the Nürnberg schools is given in a beautiful work, "Schulen und Schulgesundheitspflege in Nürnberg," 1904, which was presented as a "Festschrift" to each member of the Congress.

Dr. Schubert (of Nürnberg) has recently published a detailed account of the careful methods of medical examination of school children in Germany, "Der Schularzt," supplement to the "Zeitschrift für Schulgesundheitspflege," No. 10, 1903.

Considering that the Congress was the first international assembly on school hygiene, it must be allowed that it was well conducted. Many valuable and suggestive papers were read; altogether the Congress was a great success; and I believe every Englishman present will always look back with pleasure to the week spent in Nürnberg.

At the end of the last general address Sir Lauder Brunton (who spoke in German) invited the Congress to hold its next meeting in London, in 1907, and promised a hearty welcome. This invitation was accepted.

EPIDEMIC DIARRHEA*

BY T. A. STARKEY, M.B., LONDON AND MONTREAL

PROFESSOR OF HYGIENE, MCGILL UNIVERSITY

The present communication contains some observations upon the causes of epidemic diarrhea amongst infants, and the influences bearing upon the disorder. For our present purpose we shall include the diseases named gastro-enteritis, enteritis, entero-colitis, infective enteritis, infantile diarrhea and cholera infantum, leaving aside typhoid fever and dysentery.

The records which I shall lay before you are compiled from the deaths due to these diseases reported in the city of Montreal. They are records of *deaths*, not *cases* of disease, but as we have no other means of gauging the distribution of the disease, it is quite fair and safe to presume that where the disease is prevalent there the deaths will occur.

The records deal with 812 deaths, rather more males than females, 460 and 353 respectively. The vast majority of cases occur during the first five years of life, very few indeed above that age, and about two-thirds within the first 18 months.

From the death registers we notice that the cases of epidemic diarrhea commence about the end of May, and continue through the summer, reaching their highest number in the month of July, and finally disappearing about the middle of September. These returns show us that the course of the disease in Montreal is precisely the same as in any other part of the world as regards season and prevalence.

I propose, therefore, to give you the results of my investigations as to the causes or influences at work in Montreal, which favor the propagation of the disease and I shall confine myself chiefly to the public health point of view, because the time at my disposal prevents me entering into the question from a pathological standpoint.

I have prepared a map of the city of Montreal on which I have recorded in red the deaths reported due to epidemic diarrhea during the year 1903. It will be noticed that the red dots occur in clusters and are quite unevenly distributed, and if the map be examined closely it will be seen that a few particular streets are the ones chiefly involved.

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*Read before the Montreal Medico-Chirurgical Society, 20th May, 1904.

Now, there is obviously some reason for the disease picking out these particular areas.

Firstly, these areas do not correspond in any way with the distribution of the water supplies, so that we can safely dismiss that as a probable factor. If it were water we should have a much more general distribution.

Secondly, these areas on inspection turn out to be parts of the town in which we have low class property, narrow lanes and blind alleys, back to back houses, abundance of filth from house refuse and bad sanitary arrangements.

In nearly every place we found a small shut-in-court, the houses arranged around it, with a narrow entrance to the court-yard. The surface of the yard was quite unpaved and no provision for efficient drainage. In addition to this, as a rule, the court was very filthy from house refuse of all description. These courts can in no way be efficiently ventilated, seeing that it would be very difficult for any wind to get in and stir up the atmosphere; also being so shut in there was a very marked absence of sunlight. Under these conditions it was very obvious that dust carrying infectious material might be stirred up and would hang around in a cloud, and find its way through the open windows into the rooms bordering these areas.

We have other property in Montreal equally poor class, with equally poor and squalid inhabitants, but situated in cleaner and more open parts of the town, as in Westmount and the west end of city—where the sanitary arrangements are much better.

Thirdly, food supplies are pretty much the same all over the city for this class of people, and no connection exists between the distribution of food supplies and the cases of epidemic diarrhea. By this I wish it to be distinctly understood that I do not refer in any way to the storage of food stuffs in any place situated in the affected areas, but to the centers of distribution of food stuffs, as in milk shops and markets.

I hope to show later on that the food stuffs, as stored in the houses on these areas, are probably the chief channel by which the infectious matter gains admission to the intestinal tract. In this connection it is to be noted that the majority of cases occur amongst infants whose dietary is very limited, of which milk forms the staple article.

Hope, of Liverpool, showed by the statistics there, that a very large number of the cases of epidemic diarrhea occurred amongst infants who were hand fed and not breast fed. His observations have been confirmed over and over again. By this process of exclusion one is brought down to a consideration of the *soil conditions* in and around the houses situated on these areas.

Inspection shows that the *composition* of the soil differs little in the affected areas as compared with neighboring lots where the disease is not common. As a rule it is of a loamy nature. We know that such grounds as clay and rock do not favor the disease, but that porous loamy soils, gravelly and sandy soils, do. Still there must be something else in addition, because there are plenty of other places in the city with loamy soils, in which epidemic diarrhea occurs but rarely.

Again, the formation of the ground must be taken into account. It was found that those areas in which the disease is rife are *all low lying* as compared with the surrounding places. By this, one means that the area under consideration would have a tendency to receive sub-soil drainage from the areas immediately around. There is generally a well-marked hollow, as in a portion of Beaudry and Sanguinet streets. This undoubtedly favors drainage of the subsoil water towards this hollow, and if the soil contains polluting material, this will naturally drain towards the same level.

We have already seen that there is in every instance an abundance of house refuse lying thick all over the ground around the houses in these areas, and this refuse is particularly rich in putrescible organic matter; hence the ground itself must be very rich in this material.

Another weighty fact brought to light during these investigations is that the drainage of these districts is bad. For instance, absence of drains showed that slops thrown on the ground would not be conducted along to the sewer, or defective leaky drains tended to soak the ground with sewage.

Privies or cesspools are more often than not to be found in these areas, and as these offer exceptional facilities for the draining away of the liquid contents into the adjacent soil, it follows, therefore, that the soil in these areas must be badly contaminated by all this drainage which it receives, and by the solid refuse which is allowed to collect upon the surface.

I may here mention an interesting fact showing at least that this drainage question has some distinct bearing upon the dissemination of the disease. Near Atwater Avenue there is an area in which the privies and bad drainage were at one time very common. During the last few years they have been clearing them away, though they still exist in Albert St., Seigneurs St. and Lusignan St. In the adjacent streets of Fulford, Canning and Chatham, all privies have been cleared away, and the sanitary conditions are much improved generally. The houses themselves are practically unaltered and the inmates are of the same class as before. Now cases of epidemic diarhea are not at all numerous in these streets.

It is thus proved that the soil in these areas is badly polluted and particularly rich in drainage matter. This organic material is very rich in micro-organisms, chiefly those found in sewage.

A good deal of work has been done upon the isolation of organism and identifying them as the cause of the disease. It has been abundantly proved that a variety of organisms are capable of causing epidemic diarrhea. These are (1) Saprophytes; lactic acid group and proteus group: Pathogenic (2); colon group, *B. ent. sporogenes.* Most of the organisms isolated are of the ærobic variety.

From conditions which we find existing at times of diarrhea epidemics we shall see later that one would expect a considerable number of anærobes, and I shall hope to show at some other time that these anærobes ought to demand more of our attention as causative factors in epidemic diarrhea.

From the seasonal curves we see that climatic conditions are very important. As is well known, temperature and moisture play an important rôle in these epidemics. Ballard was the first to prove conclusively that it was only when the temperature of the earth at a depth of four feet reached 56 degrees F. that the disease spread at all. He showed also that the temperature at this depth is only influenced after several days by atmospheric temperature, so that an occasional daily variation has no effect upon it.

Wind and rain interfere very much with the spread of an epidemic, allaying the dust and washing it away, besides cooling the ground if continued for some time. Although present in dust the organisms are prevented from flying and settling on food.

We have thus the following conditions; a soil rich in organic material, loaded with organisms, warm and moist, all conditions favoring the growth of micro-organisms, and amongst them those causing epidemic diarrhea.

The next thing to settle is how they gain admission to the alimentary tract. I have already pointed out that the places most affected are those in which we have alleys, courts, very dirty ordinary soil surfaces, unpaved, shut in so that there is no external ventilation whatever, and overcrowded unsanitary houses all around. The organisms in the soil find their way into the air as dust, and so contaminate the food stuffs stored in the houses, and I feel sure that any conditions, such as paving yards and alleys, which prevent the dissemination of the bacteria bearing dust, will exert a marked influence for the better upon the course of epidemic diarrhea.

We arrive therefore at the following conclusions:

First:—Attention to external ventilation so that such things as blind alleys, closed in court-yards, should never be constructed or allowed. In this way the air ventilating the house immediately around would certainly be pure and free from infectious disease.

Second:—The proper paving and drainage of these yards would prevent the soil becoming badly polluted, eventually giving rise to infectious dust.

Third—The removal of refuse is important, applying both to house refuse, which is found lying in these yards, in many instances forming foul heaps, and also to removal of the liquid house refuse, namely that associated with drains, privies and cesspools.

Fourth:—Cleanliness; that is frequent and efficient washing of these paved yards, would lessen the incidence of disease.

These seem to be the vital things, because, it seems to me, that the prevention of food being contaminated is a much wiser procedure than to attempt to sterilize the food after it has been contaminated. At the same time one does not for a momnt minimise the good results obtained by food sterilization, because we all know that there are instances where food might be contaminated elsewhere than in the homes of the people, and under these circumstances only sterilization before consumption would lessen the risk of disease.

STUDY OF FORMALDEHYDE IN MILK: ITS GERMICIDAL ACTION AND THE GRADUAL DISAPPEARANCE OF IT FROM THE MILK

By D. Rivas, M.D.,

THOMAS A. SCOTT FELLOW IN HYGIENE, LABORATORY OF HYGIENE, UNIVERSITY OF PENNSYLVANIA

The fact that milk has been occasionally the source of disease due to its contamination by pathogenic bacteria gaining access to it from the cow or from outside sources during the milking, and the entrance of numerous bacteria during its further manipulation, and recognizing the various troubles which may result from the use of milk containing large numbers of bacteria, the practical question arises as to the best method of protecting the milk consumer.

By a careful and constant inspection of the cattle by a veterinarian, at regular intervals, the contamination through the cow itself can be most easily prevented, but in regard to the other sources of contamination which take place through the negligence in further handling of the milk, this is not an easy task. However, careful cleaning and sterilization of all utensils and strict cleanliness of the cow and milker and, furthermore, by keeping the milk at low temperature during shipment, this can be brought about in the most satisfactory manner.

Very unfortunately, the lack of cleanliness in collecting the milk and improper care of it subsequently have led to the use of artificial means to cover this negligence by using preservatives, such as boric acid, formaldehyde, salicylic acid, borax, peroxide of hydrogen, etc. The use of such disinfectants is open to several objections. They are all adulterants, and their effect upon the health of the consumer is an important consideration, as they are of a poisonous nature, and are claimed to produce digestive derangements and malnutrition.

Of all these preservatives the one most extensively used is

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[1] From the Laboratory of Hygiene, University of Pennsylvania Bulletin.

formaldehyde, which is sold under various disguises as formol, freezaline, freezine, preservaline, etc. Other substances are also sold under one or more of these names, some of which may also be found to contain formaldehyde, and others boric acid, etc.

A careful chemical analysis of the suspected milk will reveal the presence of these preservatives, and for the detection of formaldehyde, which has been the subject of our investigation, quite a number of methods are in use, as Hehner's test, the hydrochloric acid-iron test, the Denige test, Rimini's test, Jorissen's test, etc.

Regardless of the most strict precautions taken in the handling of the milk, a bacteriological analysis will show that a certain degree of contamination commonly takes place, varying according to the circumstances (from 10,000 to 100,000 in 1 c.c. of milk). These bacteria gain entrance from the air or stables and milk-houses or other manipulations, and increase rapidly, because of the rapid growth of most micro-organisms in milk.

The comparatively low number of bacteria in some suspected samples of milk brought to the Board of Health laboratory for examination, and the negative results of the chemical analysis for preservatives in such milk, suggested the idea to Prof. A. C. Abbott, Chief of the Bureau of Health, the investigation of the causes of such unexpected results.

Knowing that formaldehyde is one of the preservatives most extensively used, it was thought well to determine its germicidal action, and especially to find out whether it disappeared in time from such milk. If such disappearance takes place the relative number of bacteria found in a specimen could very properly be attributed to the fugacious action of formaldehyde. In a suspected milk a relatively low number of bacteria, and at the same time a negative result in the chemical test, would indicate the adulteration with formaldehyde.

With these facts in view experiments were made with fifteen samples of milk, five of which were kept in the refrigerator at 60 degrees to 80 degrees C., five at room temperature at 20 degrees to 22 degrees C., and the other five in the incubator at 37 degrees C. Each sample was divided into two portions, the one remained as control and to the other formaldehyde was added in the proportion of 1:1000, 1:10,000, 1:20,000, 1:50,000, and 1:100,000.

Bacteriological tests were made of each sample at once, after twenty-four and forty-eight hours, and after three days in most of our experiments, and in some of them also after four days, to determine the germicidal action of the formaldehyde. The chemical test for formaldehyde was also made in all samples (including the control) at once, after twenty-four and forty-eight hours, after three and four days, and so on. This was continued in most of the samples up to the tenth day, to determine whether there was a gradual disappearance of the formaldehyde.

For the bacteriological test the usual laboratory technique was employed, the milk being diluted with sterile water in the proportion of 1:10, 1:100, 1:1000, and 1:10,000; 1 c.c. of each dilution was plated in agar, and after forty-eight hours in the incubator at 37 degrees C. the colonies were counted. For the detection of formaldehyde in milk the hydrochloric-acid-ferric-chloride test was employed, which consisted in adding 0.1 c.c. of tincture ferric chloride to 100 c.c of chemically pure hydrochloric acid; 2 c.c. of this mixture were added to about 5 c.c. of milk, and, after shaking, were kept at 96 degrees to 97 degrees C. for about four minutes; a violet coloration of the liquid was the indication of the presence of formaldehyde in the milk, and a slight brownish or almost clear appearance indicated the absence of formaldehyde from such such milk.

It will not be out of place here to state that though the hydrochloric-acid-ferric-chloride test is one of the most reliable for the detection of formaldehyde in milk, however, in our experiments, for the sake of accuracy, this was also controlled by the sulphuric-acid-ferric-chloride test, which was found to be usually satisfactory. This consisted in adding 0.1 c.c. of tincture ferric chloride to about 200 c.c. of chemically pure sulphuric acid of 1.84 specific gravity. To about 2 to 4 c.c. of this mixture an equal amount of distilled water was added, and immediately after from 1 to 2 c.c. of the milk was poured into the test-tube and, after gently shaking, if formaldehyde was present a violet color was observed at the point of contact of the milk with the sulphuric acid, and a light brownish or almost clear appearance of the liquid was taken as an indication of the absence of formaldehyde. The charring due to the concentrated action of the acid upon the milk was prevented in this method by diluting it with equal parts of water, and so the error of taking this deep-brown or black coloration for the formaldehyde reaction, which gives a violet color, was avoided.

With all these precautions in our work the bacteriological counts of bacteria in the milk and the chemical test for formaldehyde were carried out in the most careful manner.

Making a general and brief review of all the expxeriments, we find that in most of the samples, with the exception of Samples 9 and 10, the formaldehyde showed a decided germicidal action in the proportion of 1 :1000, in some of these samples it produced a complete sterilization of the milk. In the proportion of 1 :10,000, 1 :20,000, 1 :50,000, and 1 :100,000 the germicidal action was constant, though much weaker. There is some slight irregularity in some of the experiments, which can be traced not to faulty technique, but to the coagulation of the milk and the presence of masses of fat which prevented the formation of a homogeneous mixture. This, however, does not impair the value of the results, which show very plainly the germicidal action of formaldehyde, even in the small proportion of 1 :100,000. It is not our purpose to lay much stress upon this point, as its germicidal action is known to everyone, and if this was briefly considered here, it has been merely for the purpose of corroboration and to emphasize its gradual disappearance from the milk.

Now, in discussing the gradual disappearance of formaldehyde from the milk, we find that in most of the samples it has disappeared after twenty-four hours when present in the proportion of 1 :50,000 and 1 :100,000, and in none of these was it present after forty-eight or seventy-two hours.

In the proportion of 1 :10,000 and 1 :20,000 its disappearance was also very rapid. This was observed as early as forty-eight hours, and in no instance, with the exception of three samples, was a positive reaction of formaldehyde obtained after three, four, and five days. It must be remembered that this disappearance is more rapid at high than at low temperature. In the proportion of 1 :1000 the disappearance was very slow, up to the tenth day very slight change was observed, but in time the reaction became weaker. This fact was tested by examining three samples of milk kept at the three temperatures. During twenty-five days of observation the formaldehyde began gradually to disappear. This disappearance was only partial and, as usual, was marked at high rather than at low temperature. Furthermore, in order to determine the shortest time at which the formaldehyde began to disappear from the milk another experiment was made, in which this substance was added to the milk in the proportion of 1:50,000 and 1:100,000, and the chemical test was made at short intervals. We found that after six hours there was a diminution in the amount present, and after twelve hours the disappearance of formaldehyde was easily demonstrated by the weaker reaction obtained.

Regardless of the complete disappearance of the formaldehyde from the milk, as indicated by the negative result of the chemical test, its germicidal action was always manifested in a constant way, as shown in almost all the experiments in a lower bacterial content; therefore, from the results of this investigation we may draw the following conclusions:

1. Small amounts (1:10,000 to 1:100,000) of formaldehyde added to the milk will gradually disappear from such milk in the course of twenty-four to ninety-six hours.

2. This amount of formaldehyde exerts some detrimental influence upon the activities of the bacteria in the milk, as shown by the relatively lower bacterial content of such sample when compared with control samples.

3. Samples of milk containing such small amounts of formaldehyde acidify more slowly, and do not coagulate as early as control samples.

4. The fact that samples of market milk show unusually good keeping qualities and yet apparently do not contain formaldehyde, should at once raise suspicion that these samples have had formaldehyde added to them and that in time the formaldehyde has disappeared from such milk.

In conclusion, I desire to express my sincere thanks to Dr. Abbott, who suggested this investigation.

Likewise to Dr. Bergey for his courtesy and valuable assistance during the progress of the investigation.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE

Section on Pediatrics

Stated Meeting, February 11, 1904.

DAVID BOVAIRD, JR., M.D., CHAIRMAN.

CASES OF SPORADIC CRETINISM.—Dr. Louis Fischer showed several patients.

Case I.—R. H., over two years old was first seen when eighteen months old. The child was breast-fed for seven months and later received equal parts of milk and water. Always constipated and at times had severe tenesmus. She had coarse sparse hair and a very rough skin. The tongue and lips were thick and the tongue protruded. There was difficult breathing and snoring. The thorax was rachitic, there was a funnel-shaped depression, a kyphosis and an umbilical hernia. The child could neither talk nor stand and there were no teeth. The temperature was sub-normal, the pulse 100, small and feeble. The circulation was decidedly poor and the anterior fontanel was widely open. Growth was markedly stunted, the length of the body being only 55 cm. and the muscles were flabby. The naked weight when one and half years old was 11 pounds and 13 ounces. At twenty-two months the first tooth appeared. The patient was given fresh raw milk, warm; also steak juice, orange juice, potato flour and the usual antiscorbutic remedies. Fresh albumen and vegetable proteids were well assimilated. Thyroidin in doses of one-half grain three times a day, gradually increased to three grains, was given. Also Fowler's solution in one drop doses increased to three drops three times a day. During the six months' treatment the child had grown in length from 55 cm. to 69 cm., and the weight had greatly increased.

Case II.—F. P., was first seen December 8, 1902, when the child was two years and two months old, but had been under thyroid treatment ten months before. She could neither walk nor talk. The tongue was thick and protruded constantly. The lips and skin of the face were thick, coarse and rough. The nose was short and flat. The fontanel was widely open, the face broad, and eyes set far apart. There was a marked depression on each side of the temporal bone and a marked frontal prominence. When twenty-two months old the child had nine teeth. The first tooth appeared one month after thyroid treatment was begun at the

Babies' Hospital, or when the child was sixteen months old. There were no evidences of rachitis. The body length was 50½ cm., or about 20 inches. Secretions of the body were scant and the constipation obstinate. The thyroid gland could not be felt. The temperature was subnormal and never higher than 98 degrees F. One grain of thyroid was given three times a day and increased to two and a half grains, without any cardiac disturbances. Cereals, milk, chicken soup, broths, acid fruits, etc., were given. The body length at the end of the first month of treatment was 58½ cm., amounting to an increase of 3⅛ inches. The bowels became regular. The teeth have appeared at regular intervals, and the child has begun to walk and talk. At the end of one year's treatment the body length was 85 cm., showing she had grown in one year 15½ inches.

Case III.—R. N., was first seen June 28, 1902, when seventeen months old. The infant was nursed for about sixteen months, but had not thriven after she was three months old. Severe constipation had always existed. She could neither stand, talk nor walk. Backwardness in development was very apparent. The hair was coarse and straight. The extremities were short and growth much stunted. The lips were thick and the tongue large and protruding. She had only two lower incisors. Equal parts of barley-water and milk were given the child every two hours. One-half grain of dessicated powdered thyroids was ordered three times a day. This dose was gradually increased and the child was now receiving three grains three times a day, without evidence of cardiac disturbance. Lemon and orange juices, raw albumin, vegetable soups, etc., were ordered. The condition of the child improved very much and the specific effect of the thyroid was very apparent.

Dr. Herman said that he considered the best plan of administering thyroid was to begin with small doses and to increase them gradually, watching the temperature carefully. Under this treatment the intelligence of the children seemed to improve greatly for a time; but the children never attained the normal state.

Dr. Sobel said that constipation was one of the most marked features in these cases. He relied mainly upon three symptoms to aid him in discovering whether improvement was taking place: (1) The control of the temperature; (2) the control of the constipation; (3) the decrease in the weight. He called attention to the marked dilation of the sublingual veins which appeared much like varicosities; this was due to the interference with the circulation in that particular part.

Dr. La Fétra said that there were always 8 or 10 cases of sporadic cretinism under treatment at the Vanderbilt Clinic. Improvement at first is remarkable, but only a few cases have been observed for a number of years. Those he had seen were two or three classes behind pupils of the same age, even in most favorable cases.

HERNIA OF THE APPENDIX.—Dr. Henry L. K. Shaw, of Albany, presented a specimen and drawings of this condition which occurred in a child, eleven months old, who was an inmate of the Albany Orphan Asylum. The interest in this case was revealed at autopsy.

Dr. H. D. Chapin called attention to the fact that the appendix in infants was always long and tortuous, and it was to him a wonder that this organ was not more often at fault.

CLINICAL STUDY OF 62 CASES OF INTESTINAL INFECTION BY THE BACILLUS DYSENTERIÆ (SHIGA).—Drs. L. E. La Fétra and John Howland presented this paper.

Dr. R. G. Freeman said there seemed to be a difference of opinion regarding the true Shiga bacillus cases and the so-called "acid" type; it was not known whether they were the same organism or different varieties. The cases that he had seen were of the "acid" type. In an epidemic quite near New York the real Shiga organism had been found. Last spring he was on duty in three hospitals and carried on his work under the supervision of Drs. Flexner, Park and Hiss. An ample amount of serum was supplied him. The clinical manifestations were very irregular and atypical, except in one or two instances. The characteristic feature was that these cases did not react readily to treatment. The stools were usually greenish-yellow or green and always contained mucus and, with few exceptions, some blood. Usually the organism was not found unless there was blood present in the passages. The stools averaged six a day. The course ran from one week to ten days. The mortality in the different institutions varied greatly. The autopsy findings were as atypical as the symptoms. Sometimes there was a mild and sometimes a severe ileocolitis. In order to test the results of treatment every other case was injected with the serum, the dose being 10 cc. and repeated at frequent intervals. Some patients gave a marked reaction and good results seemed to increase with the increase in the dosage. But when the mortality rate was studied it was found to be about the same as when no serum had been used. In the institutions where he saw the cases the bacteriological reports were usually very late and the serum was administered late. In the "acid" or "Harris" cases he did not always use the "Harris" serum. As a result of his work he did not believe it could be positively stated that serum did any good.

Dr. Henry L. K. Shaw, of Albany, said he had had some experience at Albany, and there was no doubt that the cases seen by him were true cases of Shiga dysentery, occurring in both adults and children. The Shiga bacillus had not been uniformly found in the stools of ordinary diarrheas. Again it was found that in some true cases of dysentery the Shiga bacillus had not been found. In a place near Albany there had occurred an outbreak of dysentery and there was obtained a true culture of this bacillus; he believed that this disease could almost be considered as endemic.

Dr. William L. Baner said he had examined 30 cases for the dysenteric bacilli, investigating stools that were watery or contained a little mucus, and he had made ten plates in each case and from one to 500 colonies. He had also made the agglutination reaction.

Dr. E. Libman drew attention to certain defects in the work that was being done and which should be remedied. He said it was not a question of numbers. The point was that the bacillus was found when mucus was present, and even more easily when there was also blood. Therefore, it looked as if they were dealing with an organism which might possibly be present, normally, in the upper part of the intestinal tract and which would multiply under certain conditions. As a rule, when mucus was found in the discharge the bacillus was found. The upper part of the intestinal tract should be examined, a work that so far had not been done. With regard to the futility of the serum in dysentery he said that one could not expect a great deal from it because there were changes in the walls of the intestines and symptoms of toxemia present. In slight cases he said the cause of death was not poisoning but was from the constant drain from the system and the loss of valuable food.

Dr. L. E. La Fétra said the paper did not undertake to prove that the cause of diarrhea occurring in infants is the dysentery bacillus. The writers wished to show that the symptoms varied greatly, when there was an infection of the gastrointestinal tract by this organism. He said that to examine the flora of the intestinal tract and identify all the organisms in each case was a mechanical impossibility. The serum should be used in large dosage in order to prove effective. He said it was well worth contrasting the cases as they occurred in the Babies' Hospital and in dispensary work. During the months of July and August there were treated at the Babies' Hospital 78 cases of diseases of the intestines; of these 78 cases 24 were infected with the dysentery bacillus, *i. e.*, 30 per cent. In the Vanderbilt Clinic 62 out of 64 cases showed the dysentery bacillus. The bacteriological examinations, however, were made by different observers in the two institutions. Of the 24 hospital cases 12 died, a mortality of 50 per cent. Of the 54 hospital cases not showing the bacillus dysenteriæ, 18 died—a mortality of 33 1-3 per cent. The serum treatment was used in 7 of the severe hospital cases and 5 died. The immediate effect of the serum was often good, being followed by a disappearance of the blood. The bacteriological report of the investigation would be published by the Rockefeller Institute.

DISEASES OF THE ACCESSORY SINUSES OF THE NOSE.—Dr. Lewis A. Coffin presented this paper and illustrated parts of it with lantern slides. He first considered the gross anatomy of the nose and made the following deductions: (1) Only two of the accessory sinuses are present at birth, viz.: the ethmoidal cells and the maxillary antrum. (2) The ethmoidal cells and the antrum are constant sinuses. (3) The antrum does not in infancy occupy the same relative position in regard to the orbit as in later life, and cannot be reached or entered by the usual methods. (4) The sphenoidal sinus makes its appearance shortly after birth, and may be found as a distinct cavity as early as the end of the first year. Practically, however, it may be considered as the most posterior of the posterior ethmoidal cells. (5) The frontal sinus is not present at birth. It appears first in the orbital plate of the frontal bone between the end of the first and the beginning of the third year. Practically at this time it is the most anterior of the anterior ethmoid cells. Diseases of the sinuses at this age are usually treated in a general way. An acute catarrhal or non-suppurative sinusitis was probably the most common disease; occurring during the course of one of the infections the sinuses of the nose, one or all, become infected and there results a suppurative sinusitis, whose severity depends upon the character of the infection, the intranasal structure, the condition of the nasal mucous membrane and the physical equation of the patient. Those infectious diseases most likely to be accompanied or followed by sinusitis are the various exanthems, acute coryza, and above all influenza. Trauma might be an exciting cause. Because there was no recognized and definite *symptomatology* the disease probably existed much more frequently than supposed. In the ordinary cases two symptoms were present, viz.: profuse nasal discharge and pain. The discharge might be mucoid, mucopurulent or purulent, and, if confined to one side, was most significant. The location of the pain in the head by no means located the disease, although this was a symptom of importance. On examining such a patient one usually found the discharge of pus between the middle turbinated bone and external wall of the nose, *i. e.*, in the middle meatus; and one should then conclude that the disease affected one of the anterior cavities, the frontal sinus, anterior ethmoidal cells, or the antrum. A like discharge in the olfactory cleft or between the turbinated and the septum, pointed to disease of the posterior ethmoidal cells, the sphenoidal sinus or both. In the more severe cases the pain was greater and might be felt in and about the eye, and there might be swelling of the lids and exophthalmos. This might occur, also, with diseases of the anterior ethmoidal cells, frontal sinus and antrum, the point of greatest swelling, the position of the eye, or, possibly, a sinus opening, indicating which sinus was involved. Severe occipital pain, and pain back of the eye, together with pus seen in the superior meatus pointed to the severer type of sphenoidal disease.

Treatment must be either palliative or radical. In the less severe cases every effort should be made to establish free drainage, and to this end sprays of a weak solution of cocain and adrenalin should be used several times a day, together with frequent steaming of the parts. The internal use of suprarenal extract had been of value in his hands. Intranasal probing and catheterizing in children was not practical, and one of the radical operations must usually be done. In adults various openings and routes to reach the various sinuses had been resorted to. Ethmoiditis was probably the most frequent of the sinus diseases from which children suffered, and for radical operation an incision was made in the side of the nose parallel with its anterior border and near the inner canthus. The periosteum was then raised and an entrance effected into the ethmoidal tract through the os planum, or by a partial disarticulation and reflection of the nasal bones. A thorough opening of the entire ethmoidal tract, including the sphenoidal sinus, was now easily made. Having curetted out this labyrinth of cells the cavity should be packed with iodoform gauze. The passages soon fill with granulations and the patient should be well in one or two months. Histories of several cases were then related in order to illustrate certain of the points.

Dr. C. G. Coakley stated that Harper had performed autopsies on thirty children, who had died of various infectious diseases, and had found a suppurative involvement of the accessory sinuses in all. The reason the disease was not recognized earlier was because of the intractibility of children when under examination.

Dr. W. L. Stowell felt quite sure that many cases that were reported to be meningitis that recovered, and did not present any definite symptoms, were not cases of meningitis at all but ethmoiditis or other sinus disease.

Dr. Emil Mayer said there were two definite conditions to be considered: (1) external injuries producing bone disease, fistula, and so an entrance into the accessory sinuses; (2) infection from such diseases as scarlet fever, diphtheria and influenza.

PHILADELPHIA PEDIATRIC SOCIETY

Stated Meeting, Tuesday evening, March 8, 1904.

Dr. John H. Jopson, in the Chair.

Congenital Syphilis.—Dr. W. C. Drein exhibited a case of congenital syphilis in a boy fourteen and one-half years of age, in whom there was marked enlargement of the liver and spleen. The child's father was syphilitic, the mother denying infection. Two of their children had died in infancy, of syphilis, before the birth of this boy. A child born since then has always been healthy. This boy was normal at birth. He had eye-symptoms at the fifth week, and an eruption on the hands and feet at the sixth. General symptoms developed later, and lasted two years. These cleared up temporarily under treatment, which was renewed at intervals. The child had necrosis of the lower end of the left ulna five years ago. His first teeth were poorly developed; his second appeared one year ago, the upper left lateral incisor being notched. The patient was seen by Dr. Drein in the Dispensary of the Episcopal Hospital in September, 1903. He was then pot-bellied; the liver and the spleen extended below the umbilicus; there was some fluid in the abdomen; and a keratitis and iritis of the left eye were present. He was put on potassium iodid, which he continued to take for one month. He did not return to the dispensary, but was looked up in February, 1904. At this time, the liver and spleen were somewhat smaller; but the liver seemed nodular. There was a distinct corneal ulcer with active iritis of the left eye. The conditions are now the same, except that the corneal inflammation has subsided.

Dr. D. L. Edsall said that the patient was interesting to him on account of a case that he exhibited to the Pediatric Society several years ago. The patient was a girl of the same age as the boy presented by Dr. Drein. The conditions in her case were very similar, except that the liver showed at least two large gummata. These were so conspicuous, on account of their size, and the pain and tenderness that they caused, as to have led her physician to send the patient to the hospital with the diagnosis of sarcoma. When exhibited, the girl showed almost normal conditions, so far as the liver and the spleen are concerned; but she still had a very high grade of albuminuria and a persistent tendency to general edema. It is of interest to note, said the speaker, that she afterwards entirely recovered from the latter conditions as well. She was seen by Dr. Edsall a year after this. At that time she had long been free from edema, and her urine was normal: she presented no evidence of disease except deafness and corneal scars. A fact recently emphasized by John Rose Bradford is that syphilitic patients presenting marked evidences of renal disease, often with decided albuminuria, not infrequently get entirely well of this; even though it has lasted a long time, and though in the beginning the prognosis may have seemed very unfavorable. The girl mentioned is an example of this.

HYPERTROPHIC PULMONARY OSTEOARTHROPATHY.—Dr. D. J. M. Miller showed a child eight years old, with hypertrophic pulmonary osteoarthropathy. The patient has had Pott's disease since her third year. She was in the Orthopedic Hospital for a long time, but for the last eight months has been an inmate of the Surgical Ward of the Episcopal Hospital. She is very much deformed, the angular projections in the upper dorsal region being of extreme degree. For a long time she has had a cough—how long, it is impossible to say; as she is the only one from whom her history can be obtained. There is, however, no sputum, and only a slight degree of fever (98 degrees to 100.5 degrees). While at the Orthopedic Hospital and since she has been in the Episcopal Hospital, the remarkable condition of her terminal phalanges was regarded as an extreme case of Hippocratic fingers. Dr. Miller, observing that there was no cyanosis, made a careful examination of the chest. This revealed, over the right supraspinous fossa and scapular region, dulness, bronchial breathing and pectoriloquy. The bronchial breathing is peculiar, in that it has a distinctly distant character and is free from râles; it gives one the impression of an old and inactive cavity. There are no heart murmurs. The distal phalanges of the fingers and toes are much hypertrophied and thickened, the great toes, especially, being twice the size and thickness of those of a normal child of this age. The finger-nails are shaped like a watch-glass, and curve over the finger-tips like a parrot's beak. There is absolutely no cyanosis. The X-rays show thickening and enlargement of the entire distal phalanges. The picture differed from the radiograph of clubbed fingers in a case of congenital heart-disease, which showed no enlargement of the terminal bones.

Dr. Miller referred to the fact that hypertrophic pulmonary arthropathy is a disease of adults. In it, not only the terminal phalanges, but also the remainder of the bones of the hands and feet, as well as the long bones of the forearms and legs, are enlarged—particularly the articular ends of the latter, which are so altered that movement is impeded. In this patient the long bones and the joints are not affected, the hypertrophy being strictly confined to the terminal phalanges. Dr. Miller knows of no true cases of osteoarthropathy in children, except Whitman's (PEDIATRICS, II., 154-162). Gillet, Moizard, Marfan, Moussous, and others, have described under this title, cases of hypertrophy of the terminal phalanges in children, with pulmonary tuberculosis and emphysema, particularly the latter (in a word, a condition similar to this child's); and Rotch reported last year to the American Pediatric Society a case of like character. If these cases are genuine instances of the affection in question, it is evident that in children the disease is practically limited to the terminal phalanges; unless, as Whitman's case appears to show, hypertrophy of the distal phalanges is an early stage of the affection, the enlargement of the long bones occurring later. His patient was under observation for a long time, and the case was at first considered to be an instance of Hippocratic fingers.

Dr. Jopson asked for information as to the degree of Pott's disease present in the case, and inquired whether the pulmonary compression and distortion consequent upon that disease could have been the cause of the changes in the extremities.

Dr. Edsall asked Dr. Miller whether there was any evidence of peripheral neuritis, and referred to the fact that a number of foreign observers have, within the last few years, leaned toward the view that the condition is due to neuritis—a view that seemed to the speaker extremely unsatisfactory, both because the vast majority of cases of peripheral neuritis are unassociated with such changes, and because somewhat analogous conditions of the extremities are so frequently associated with no definite changes in the nerves. Among analogous conditions in which there is no evidence that such disease of the nerves has given rise to the condition, but in which there is evidence of a general toxic state, Dr. Edsall mentioned the clubbing of the fingers that occurs in the advanced stages of so-called splenic anemia, and the peculiar changes in the fingers, first described by Bouchard as occurring in gastrectasia. He believes that the changes in the nerves described in cases of hypertrophy of the long bones and of the soft tissues over them are probably due to the same cause as are the other lesions, but are not themselves the cause of these lesions.

UNDESCENDED TESTICLE.—Dr. L. J. Hammond exhibited two patients whose conditions bore directly upon the treatment of inguinal hernia complicated by undescended testicle. The first patient was a boy two years of age, with a left inguinal hernia (oblique), the testicle being adherent in the canal, one inch externally to the ring, and firmly fixed. The speaker believes that fetal peritonitis, rather than any defecttive conformation of the parts, was the cause of this condition. He thinks that in treating hernia of this type the undescended testicle should be transplanted into its proper position in the scrotum, after which mechanical appliances may be put on and worn up to the sixth year. After this, if necessary, operation should be performed.

HYPOSPADIAS.—The second case was one of hypospadia with right inguinal and umbilical hernia. The hypospadia was of the balanic form, the mildest of all its grades. In this case, also, the testicle is seriously in the way of mechanical treatment of the hernia—in this instance, on account of adhesions to the hernial mass. Consequently, it is carried into the abdominal cavity when the hernia is reduced. This form of hypospadia can, in Dr. Hammond's opinion, be safely left alone for a while. The hernia should be treated with pressure produced by a padded cork, held in position with straps. The treatment is first directed toward freeing the testicle and transplanting it into the scrotum. After this, a hard-rubber truss may be used. If this course is not successful, the patient should be operated upon.

PYOPERICARDIUM.—Dr. J. D. Milton Miller and Dr. J. C. Gittings reported a case of pyopericardium complicating ileocolitis in an infant of four and one-half months. The secondary nature of purulent pericarditis in children was pointed out, and its comparative frequency emphasized—especially the tendency of pericardial effusions to be of the purulent variety in infants and in very young children. After the fifth or the sixth year, the etiological influence of rheumatism comes into play, and the effusion is usually serous. Batten's and Still's statistics were quoted; these showed that actual pus is found in about 3 per cent. of the autopsies upon children. In the Children's Hospital, Philadelphia, however, the proportion was much lower, not more than one per cent. having shown pus in the pericardium. The most common cause was emphysema, especially left-sided, either alone or accompanying pneumonia), and a variety of other affections, particularly pyemia-producing processes. Gastroenteritis and ileocolitis are occasionally the cause, as in the case reported. The bacteria usually present in suppurative pericarditis are those of the primary infection, although the pneumococcus is by far the most frequent. The infection of the pericardium may occur at any stage of the primary disease; in the case reported, it was probably a terminal infection. The authors spoke of the infrequency with which the affection is recognized during life, because of the indefinite symptoms: the absence of friction, cardiac enlargement, and other signs by which the disease is diagnosed in adults. The reasons for failure in diagnosis are chiefly the small amount of pus usually present, the absence of dilatation, and failure to keep in mind the possibility of its occurrence. As the issue is mostly fatal, and as the only hope lies in prompt drainage, the necessity of making frequent examinations of the heart in all affections in which pericarditis may supervene, in order that operative measures may be instituted at the earliest possible period, was insisted upon. The case reported was that of a baby, four and one-half months old, who, after three months' illness, characterized by bloody and mucous stools, with moderate elevation of temperature and slight cough, succumbed at last through exhaustion. The disease of the pericardium was not suspected during life. The heart had been listened to several times, but nothing except gradually increasing feebleness of the sounds, a condition attributed to the marked asthenia, was noted. Neither was the interesting condition of the lung recognized or thought of, the only pulmonary symptoms being cough and bronchitic râles. The pathological diagnosis, made from the autopsy-findings and from the examination of microscopic specimens, was as follows:—Fatty and congested liver; moderate parenchymatous change in the kidneys; subacute interstitial colitis, without ulceration; pleurogenic interstitial pneumonia, with small scattered areas of pneumonic consolidation; and serofibrinous pericarditis. Cultures from the pericardium and the spleen showed a mixed growth, which failed to grow on reinoculation and could not be isolated.

The post-mortem records of the Children's Hospital since 1896 show six cases of serofibrinous pericarditis, and only one of purulent pericarditis, among three hundred and one autopsies. Among this number there were also six cases of adhesive pericarditis. Twelve cases showed an excess of pericardial fluid (over 30 cc., estimated).

TRAUMA AND PERICARDITIS.—Dr. T. S. Westcott said that he thought that neither Dr. Miller nor Dr. Gittings had included traumatism among the causes of suppurative pericarditis. Such a case had come under his own observation about nine years before. It was reported to the Pathological Society on October 25, 1894. The patient was an infant six months old. The cause of the extensive pyopericardium was a wandering needle. This needle had accidentally, and without the patient's knowledge, entered the chest in the second intercostal space, about the costochondral junction on the left side. The child was first seen in the Dispensary of the Methodist Hospital, where it was brought for a small inflamed swelling in the epigastrium. At a subsequent visit, a point of suppuration in this swelling became evident; and projecting from it was found the eye of a sewing-needle, one and three-quarter inches long. On removing this, a sinus was found, in which a probe could be passed about three inches backward and slightly upward—apparently close beneath the under surface of the diaphragm. Within about ten days after the first visit, the patient was referred to the Medical Dispensary, where a large area of dulness, occupying the position of the pericardium, was readily detected. Death occurred thirteen days later.

At the autopsy, the pericardium was found to contain 60 cc. of thick yellow pus, in which were large curds of lymph; and similar masses were found covering the whole surface of the heart. It was quite evident from scars near the roots of the great vessels, and from a perforation of the diaphragm communicating with the end of the sinus in the epigastrium, that the needle had perforated the chest wall near the base of the heart; traversed the pericardium; pierced the diaphragm; and finally presented itself in the epigastrium, having infected the pericardium in its course. The pus contained the Staphylococcus pyogenes aureus. The large curd-like masses of lymph would have effectually prevented successful aspiration of the pericardial sac—an operation that in eleven cases collected by Février, in 1889, was attended with a mortality of one hundred per cent. Of four other patients treated with incision and drainage, two (both adults) recovered. In this case, nothing but prolonged scraping could have relieved the heart of its coating of shaggy lymph, and nothing but prolonged irrigation—a proceeding that in at least one case (Parker's) caused a fatal termination—could have cleansed the cavity. The tender age of the patient offered a decisive contraindication to radical operation.

Dr. Jopson said that he had understood Dr. Miller to state that friction-sounds are rarely present in these cases of pyopericardium. He referred to a case under Dr. Wharton's care recently seen by him. A small abscess had appeared on the foot; and, although this abscess was opened, the child thereafter exhibited dyspnea and fever, and appeared to be gravely ill. A decided friction-sound was frequently heard toward the base of the heart. Puncture revealed nothing, but the case came to autopsy, and a pyopericardium with malignant valvulitis of the aortic cusps was found.

Dr. Miller said that he had not previously seen Dr. Gittings's portion of the paper, and that he had been interested by the conditions described as present in the lung. He referred to the views expressed by Dr. Jacobi before the Philadelphia Pediatric Society in regard to primary interstitial pneumonia, and said he considered Dr. Gittings's observations interesting in this relation.

He wished to be clearly understood that the figures read by him related to purulent pericarditis, and not to pericarditis in general. He had been somewhat struck with the fact that Dr. Gittings had found but one case of purulent pericarditis among the large number of post-mortem examinations at the Children's Hospital that he had gone over. This result is in striking contrast with the fact that the English report about 3 per cent. of cases of purulent pericarditis in their hospital autopsies, mostly occurring after empyema. The number of cases seen in this country is much smaller. As to the friction-sound, Dr. Miller said that he had not himself had any experience with these cases in young children. His belief, however, is that while friction-sounds are said to be often absent in these cases, the more frequently and the more carefully they are listened for, the more commonly will they probably be heard. One point worthy of note in this connection, said the speaker, is that many of these cases occur amid circumstances that do not lead one to make an examination of the heart; therefore, friction-sounds may often be present, although undiscovered.

Dr. Jopson, in relation to the difficulty of making a diagnosis in cases of this sort, referred to a case of Dr. F. A. Packard's in an infant. Dr. Packard thought it probable that the child had abscess of the liver. At his request Dr. Jopson made a puncture at the point designated by Dr. Packard, and found that there was no abscess of the liver; but autopsy showed that there was a large pyopericardium.

Dr. Gittings, in closing the discussion, said that it must be remembered that the serofibrinous exudate could easily become purulent, even if not already so considered; but that, even with this addition, the figures for purulent pericarditis, as Dr. Miller had remarked, are extremely low as compared with those published by Englishmen.

Dr. Gittings had himself been much interested in the condition of the lung on account of Dr. Jacobi's views, and thought that the specimens that he had exhibited under the microscope offered some confirmation of these opinions.

INTUSSUSCEPTION—Dr. H. K. Hill read the report of a case of intussusception, with operation and recovery, the patient having been in the service of Dr. Le Conte at the Children's Hospital. The child, who was eight months old, was admitted to the hospital on February 25, at 2.30 P. M., and was operated upon at 3.45, after the following history had been obtained: The infant was breast-fed and had had no especial disease. Gastroenteritis had developed seven weeks before this attack. There had been frequent colic and vomiting, with greenish, mucous stools, blood having been present in the stools during the last week. On February 24 the vomitus was blood-streaked, and the same thing occurred the next day. Four inches of the bowel was found prolapsed through the anus, on February 24, by Dr. Rovno, who made a diagnosis of intussusception, and sent the patient to the hospital. The child showed a characteristic mass in the left iliac region, and rectal examination disclosed the lower end of the intussusceptum. There was a leukocytosis of 20,160, which by the next day had increased to about 13,000.

On operation, after having made an incision in the middle line, a mass was brought into view. This was reduced by gradually ascending pressure. The cecum, with the appendix, was found invaginated in the large intestine for a foot and a half. The possibility of such an occurrence was provided by the existence of an extraordinarily long mesenteric attachment, its length being nine inches. The cecum contained a hard, round mass at the base of the appendix—which made its reduction somewhat difficult. The cecum was sutured to the peritoneum and the anterior abdominal wall; and the wound was closed without drainage, the operation having lasted sixteen minutes.

The child was subsequently fed partly by rectum and partly by mouth for twenty-four hours. The mother then nursed the infant every three hours for a week, after which a milk-modification was prescribed. After the operation the stools were at first of a bloody, mucous character, but they gradually became normal. On March 8, the thirteenth day in the hospital, the wound was entirely united and the patient was discharged.

Dr. Jopson said that he had seen the patient at operation, and that the case illustrated the value of early operation. Injections are said to be useless when the bowel has prolapsed, and prolapse had occurred in this case.

EDITORIAL

SOME OBSERVATIONS FROM VIENNA

In an interesting letter to the Albany Medical Annals for August, from Vienna, Dr. Henry L. K. Shaw, of Albany, among other things, makes some very pertinent comments concerning the subject of pediatrics as reflected in Austria's capital.

Speaking of a new method for the radical cure of infantile umbilical hernia as devised by Escherich, he says:

The operation consists of injecting melted paraffin into the peritoneum under the umbilical ring and thereby forming a pelotte which fills up the ring and prevents the escape of the hernia. In other words, these infants are furnished with a genuine and serviceable "belly button." The success depends on a strict aseptic technique. The melted paraffin is drawn into a metal syringe and a few drops forced under the abdominal ring. At the same time an assistant cools the surface with an ethyl chloride spray. The operation takes less than a minute. A tight bandage is then placed around the abdomen and nothing more is done for a week, when the bandage is again applied. Over one hundred such injections have been made without a single bad result. He had an opportunity of seeing an autopsy on a child who had received this treatment several months before and who died from tuberculous meningitis. The paraffin was imbedded in the tissue and formed a movable button which perfectly closed the opening in the ring.

Speaking of serum therapy he has to say that the success of serum therapy in both curing and preventing diphtheria and tetanus has led to its employment in many distinctively bacterial diseases. The results have not always been entirely satisfactory. The latest attempts have been made in scarlet fever. Dr. Moser, the first assistant in Professor Escherich's clinic, who has just been appointed Privat Docent, began his experiments three years ago to produce an antistreptococcus serum from the streptococci found in the heart blood of scarlet fever cases. These streptococci are injected directly into the horses, and it takes about eight months to produce the antitoxic serum. The results in the scarlet fever wards of Annakinderspital, the Wilhelmina Kinderspital and Bokai's clinic in Buda Pest are just as remarkable and striking as are seen in diphtheria after the use of the diphtheria antitoxin. The serum is only used in the very severe and lethal cases, and in nearly every case the temperature falls to normal within eight hours after its use, and there is rapid improvement of all the symptoms. It is little short of marvelous to see a very severe case with a temperature of over 104 degrees receive the serum and within eight hours have a normal temperature. Two hundrd cubic centimeters of the serum are injected, which seems a tremendous dose, but it is well borne by the children and is not very painful. A secondary serum exanthem and fever occur in about three-fourths of the cases, but it is not at all serious. The scarlet fever mortality in the Annakinderspital has been reduced one-half since the use of the Moser serum. Before 1900 the mortality ranged from twelve to twenty per cent., since that date the mortality ranged from 6.3 to 8.5 per cent.

Dr. Shaw makes some pertinent comments concerning the new infants' hospital in Vienna which are instructive. The Wilhelmina Hospital, he says, is the largest, most elaborate and most expensive children's hospital in the world. It is situated far from the center of Vienna on ground purchased several years ago with the idea of erecting the new Allgemeines Hospital there. When this scheme fell through the Kaiser built the present Children's Hospital and gave it to the city. The hospital is composed of over forty separate buildings. The division for infectious diseases contains twenty-one separate pavilions and none are less than one hundred feet apart. These pavilions vary in size. The larger ones contain a room for a physician, a well-equipped laboratory, an operation room, two separate isolation rooms, a nurses' room, a twelve-bed ward and a solarium. All the walls are wainscoted with white glazed tiles and the entire construction and equipment show a princely disregard for expense. This hospital must be seen to be appreciated. Theoretically it is magnificent, but practically it is a failure. The architect designed it without the aid or advice of a physician, and the result was inevitable.

The buildings are so far apart it takes a long time for a physician to respond to an emergency call. It takes the attending physician about four hours to make his daily visit, and in doing so he has to walk over a mile out of doors. The disadvantages and discomforts in winter and on rainy days can be imagined. The hospital is so far out of the city it is impossible to get enough assistant physicians. The danger of conveying infection from one pavilion to another is not avoided by separating the buildings. Nurses will not remain in one small pavilion all day and are sure to visit the neighboring buildings. The physicians rarely change their gowns going from one pavilion to another, and in making the rounds of nineteen pavilions the other day we only changed our gowns once. It is a striking commentary that a very large number of cases of mixed exanthem (measles and scarlet fever) has been observed in this alleged model infectious disease hospital.

THE SENSE OF SMELL AS A DIAGNOSTIC AID IN DIGESTIVE DISTURBANCES

It is an inference drawn from studies in comparative anatomy that in man certain senses which in lower animals play an important rôle in the struggle for existence have become of comparatively minor importance, and that the site of the cerebral grouping of the cells concerned has become relatively smaller.

This is very striking when one considers the sense of smell and the olfactory lobes. It is probably true that the sense of smell plays a rôle of much greater importance in a large number of animals than in man, and all students of brain anatomy know somewhat of the relations in size of the olfactory apparatus.

To this curtailment of the olfactory faculty, anatomical as well as physiological, in man, has been superadded a certain carelessness, for the most part, on the part of the individual, and negligence on the part of educators whereby a most important discriminating sense has been reduced to play a very minor rôle in the day's work.

It is to be regretted that the education of the sense of smell as a means for accurate observation and for diagnosis in disease has not received the encouragement that it might have. Particularly is this true in the realm of diseases of children, and more especially in those disturbances related to the functions of digestion.

The odor of the stools offers an important means of diagnosis as to abnormal types of fermentation and putrefaction, and yet almost nothing concerning it is to be found in any of our text-books or monographs. The studies of Uffelmann, Biedert, Schmidt, Strassburger and others, leave much to be desired, but they are opening up a neglected path that promises vistas of clearer appreciation of intestinal processes.

There are many reasons, it is true, why such studies are difficult to record. We lack definite terms of description for odors—not being like the Japanese, adepts from childhood in smelling games—and we are unable to arrive at standards for smell in any sense analogous to the standards we have for sound or for light-waves.

Notwithstanding the difficulties of the situation, however, we believe that a careful registering of one's impressions concerning the odors of the stools, particularly of infants, will constitute a practical fund of facts that can be of inestimable service in the difficult field of infant feeding.

fifty years ago, or even less, the necessity for giving special care to the chronic insane was not recognized; nor was there any systematic attempt made to separate the insane into different classes. Indeed, it is sad to reflect upon the manner in which the insane were treated in the early part of the last century. How great is the contrast at the present day! Now every State is provided with well equipped asylums, where the insane are properly classified and where the treatment is of the most humane kind. Industrial institutions for the chronic insane have been established in many States, as well as institutions for the criminal insane. What promises to be of great value from a scientific and humanitarian point of view are the psychopathic hospitals, one of which is about to be opened in New York, and it is to be hoped that hospitals of this kind will before long be found in every State.

In 1890 there was in the United States not a single hospital, colony, or institution of any kind devoted exclusively to the care of epileptics. It is true that in a few of the State almshouses, or institutions for the feeble-minded, there were wards set aside for those inmates who were suffering from epilepsy, this was the first attempt to do anything for epileptics as a separate class. Even in Europe, twenty years ago, there were but few colonies for the care and treatment of epileptics. Germany, France, Holland and Switzerland had several "colonies of mercy," but there were none in England at that time. The most notable of these were the famous Epileptic Colony at La Force, France, which was started by Pastor Bost in 1848, and the wonderful colony at Bielefeld, Germany, which beginning in 1867 with four patients, in 1898 contained 1,516 patients, including men, women and children.

While it is true that this country has been undoubtedly slow in making any provision for the care of this unhappy class, there has been most marked growth in the past thirteen years in the establishment of institutions of various kinds. In his presidential address last year, Dr. Peterson, referring to the growth of institutions for epileptics, stated that in nineteen States provision had been made for the care and treatment of persons suffering from this disease. During the past year a new State hospital for epileptics has been begun at Springfield, Maryland, and the Kansas State Hospital for Epileptics, said to be the most modern epileptic hospital in existence, was opened October 19 with 120 patients. By January 1 it is expected that there will be 200 patients, and when fully completed there will be accommodations for between 800 and 1,000 patients. In Canada, the Ontario government has appropriated $30,000 for the erection of an epileptic hospital at Woodstock. England is not behind this country, for in addition to the colonies for epileptics already established, those at Maghull, at Chalfont St. Peter, the Meath Home of Comfort, and St. Luke's Home at Bournemouth this year (1903) a new epileptic colony has been established at Ewell, Surrey, at a cost of nearly $500,000.

Here on a farm of 112 acres, with numerous cottages and buildings, 325 patients can be accommodated.

During the past year bills have been introduced in the legistures of several States for the endowment of epileptic colonies, but unfortunately no appropriation has been made for the purpose. There is no doubt, however, that it is only a question of time that in every State in which the effort has been made to establish colonies the legislature will eventually make the necessary provision for the purpose, as those interested in this object are deeply in earnest and steadfast in their purpose.

RECENT STUDIES ON EPILEPSY.—Much has been added to the literature of epilepsy during the past year. Some excellent scientific papers have been published both in this country and abroad on the etiology and pathology of the disease, and the already voluminous list of therapeutic measures has been vastly increased. Krainsky, of Charkow, asserts that there is a close and constant connection between the excretion of urea and epilepsy. Every attack is preceded for from twenty-four to forty-eight hours by a diminution in the amount of urea excreted, and in his opinion as long as an epileptic excretes 0.6 to 0.8 of urea during the day there is no danger of an attack, but if the excretion falls to 0.45 or 0.35 one is imminent. He, therefore, suggests that epilepsy, instead of being a purely nervous affection, may depend on anomalies in metabolism. He made experiments on animals by injecting the blood of epileptics during an attack, and found that they were affected with paralysis and epileptic attacks, terminating in death in forty to forty-eight hours. Injections of carbamic acid ammonium produced exactly the same effects. Krainsky ascribes the symptoms to an accumulation of this salt in the organism, advancing the theory that during an attack it is transformed into urea and water. This assumption he considers harmonizes with the known favorable effects of potassium and sodium bromide, as they form a salt, the harmless potassium and sodium salts of carbamic acid. This theory, however, does not explain the beneficial effect of other bromides, or of bromine in the form of bromopin.

Other writers, among them Dr. G. W. McCasky, Fort Wayne, Ind., have called attention to the influence of gastrointestinal diseases on epilepsy, indicating that chronic disorders of the stomach and intestines by toxic and reflex influences excited, perpetrated and exaggerated epileptic phenomena.

Cabisto, guided by the experiments made in 1888 by Queirola concerning the toxicity of perspiration in general, has made some investigations of the same in epileptics. He has been able to show that the perspiration collected during or immediately after an attack almost killed the rabbit into which it was injected, and on the other hand, that secreted by a patient at a period remote from an attack was inoffensive and differed in no way from that of a healthy person. Basing his theory upon these experiments, Cabisto has largely made use of the diaphoretic treatment of epilepsy. He used bromide treatment in connection with these experiments, so that the results are not absolutely conclusive as to the advantage of diaphoresis.

Clark and Prout, in an interesting communication on epilepsy express their belief as to the excitant being a toxic or autotoxic agent, for the following reasons: (1) The lesion is a general one, affecting the entire cortex. (2) It involves most extensively the cells of the second or so-called pyramidal layer, the cells of which present a relatively larger surface exposed to the circulating poison in proportion to their volume than the larger pyramidal layer. (3) The presence of a marked neuroglia proliferation. (4) That the changes of the cell are quite analogous to those definitely known to be caused by toxic agents, such as alcohol, tetanus toxin, and autotoxins. They conclude as a result of the study of twenty-one cases from Craig Colony that epilepsy is a highly sensory motor reflex phenomenon, and in all the autopsies the same lesions were uniformly found. The evidences of cortical degeneration were varied.

Toxemia and autointoxication are not universally accepted as established factors in the etiology of epilepsy. At a meeting of the Medical Society of London on February 9, 1903, epilepsy was made the subject of discussion, and the views of the best British authorities on nervous diseases were set forth. Dr. J. S. Resien Russell said the theory that epilepsy resulted from autointoxication was that most generally received, but in his opinion it could not be looked upon as proved, and pointed out, as has been done by others in the past, the fact that treatment directed to the elimination and correction of toxic material in the intestinal tract had not been as successful as the old bromide treatment.

Horsley made some interesting remarks dividing epilepsy into four groups, and referring in a general way to the effects of surgical measures upon the disease. He believes that in congenital focal epilepsy, operation is more promising than in other cases, except those cases of new growth, which he said were always very amenable to surgical measures. A number of other speakers discussed the subject, and most of them expressed themselves as somewhat skeptical as to the toxic origin of epilepsy.

Turner has analyzed 366 cases of epilepsy, chiefly derived from the dispensary records of the National Hospital for the Paralyzed and Epileptics. A family history of epilepsy was found more frequently among confirmed epileptics, but a hereditary history of epilepsy did not necessarily impair the prognosis. Biron expresses the opinion that the importance of heredity has been exaggerated by many writers, and he points out the remarkable variation in the percentage given by different authors: Gowers, 35 per cent.; Tissot, 9 per cent; Leuret and Delasiauve, 10 per cent.; Berger, 32 per cent.

The general experience, however, in regard to heredity is that, although there is often a family history of insanity, alcoholism, or some other neurosis, it is in only a comparatively small proportion of cases that there is a history of epilepsy in a direct line. An analysis of 968 cases of epilepsy which have been treated at the out-patient department of the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases in the past twenty years shows that there were 889 cases in which there was no family history of epilepsy nor of any other neurosis. There were but thirty-two cases, a trifle under three per cent. in which there was a direct hereditary history of epilepsy. There were twelve cases in which a brother or sister had epilepsy, and one in which a daughter suffered from the disease. In twenty-six cases there was a heredity of some neurosis, such as hysteria, migraine, or neuralgia, in a direct line.

TREATMENT.—Many suggestions have been made as to the treatment of epilepsy during the past year, but in many instances the writers are rather hasty in reporting their results and do not wait long enough for the test of time to verify their experience. It is a well recognized fact that in almost every case of epilepsy there is an improvement in the patient's condition and a diminution in the number of attacks for several weeks under almost any form of treatment which is adopted, and, therefore, one should not place too much reliance on cures of only a few weeks' standing. Among the novelties in treatment are hypodermic injections of cerebrin, the application of the X-rays, which is a fake, and antirabic inoculations. Lion reports fifteen cases in which cerebrin was used after the method of Poehl. In two cases there were no more attacks after the first dose of the preparation, although the reporter does not give the length of time which had elapsed. Five cases were much improved; in seven cases the attacks became fewer and lighter; in one case the number of attacks increased, but were changed from grand mal to petit mal. The cerebrin extract is given either in tablet form or subcutaneously. A case has been reported in which an epileptic suffering from rabies was cured by the Pasteur method; following this treatment there was an arrest of attacks for a long period. It has, therefore, been suggested that epilepsy may be amenable to this plan of treatment.

Urbane Alessi, believing that epilepsy depends on profound and well marked changes in the metabolism of the body, suggests a treatment which aims at molecular reconstruction. He advises a combination consisting of sodium arsenate 0.001, zinc phosphide 0.05, calcium phosphate 0.08, sodium benzoate and pancreatin each 0.20, to be given one to three times a day. He reports four cases in which good results were obtained by this treatment, and adds that in cases in which there is a marked hereditary tendency to nervous affections this treatment is of no value, as it is merely reconstructive and cannot affect cells that are already "deeply compromised" from heredity.

De Cesare reports eight cases of epilepsy treated for a period of six weeks with a mixture of bromide of potassium, codeine, and the adonis vernalis given twice a day—the Bechterew treatment. In four cases there was complete suspension of the fits; in three cases the fits were replaced by infrequent attacks of vertigo; and in the last case there were four attacks of vertigo and two convulsions. This is one of those cases in which the length of time which elapsed since treatment began is so short that little significance can be attached to it.

Jarnot writes a paper approving of the use of bromides. Bromide of potassium he continues in the first rank, and recommends rather heavy doses—that is, 60 grains per day up to 150 grains per day, depending upon effect—and he dwells particularly on the careful continuous dosage.

Probably the most important suggestion that has been made within recent times concerning the treatment of epilepsy is the withdrawal of salt from the food. It is stated that this suggestion was made by Hughlings Jackson thirty years ago. White contributes an article on the topical treatment of Jacksonian epilepsy. The plan adopted by him is to inject a solution of eucaine into the substance of the brain after having removed a half-inch button of bone in the skull over the defective center. He reports one case in which this plan was adopted. The attacks lessened, but the final result is obscure, as the patient disappeared about nine months after the beginning of treatment.

Bromipin has been used by a number of writers with varying results. Lorenz states that he used it in thirty-four cases, with improvement in a majority of the cases, and he believes that the results are superior to those of the opium-bromide treatment. Chloretone has been used more extensively, and has proved undoubtedly of great value in certain classes of cases. Hammond, Weeks and the writer have had the most favorable results from its use. Impens believes that chloretone is an extremely dangerous narcotic, much more dangerous than chloral, and I have myself seen a mildly stuporous condition arise from the administration of only six grains a day, but other observers report the use of very much larger doses without any ill effects. After all, the fact remains that our mainstay and sheet-anchor at the present day are the bromides. Most of the new remedies which have been reported as effective have been used in conjunction with the bromides—for example, horse-nettle, adonis vernalis and opium. At Bethel almost 300 pounds of potassium bromide is used every month.

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ORIGINAL ARTICLES

SUMMER DIARRHEA OF INFANTS*

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It has been my good fortune to be personally acquainted with many of the pioneers in the field, to work with them in the laboratories, hospitals and dispensaries, and to see the difficulties attending the unraveling of this question of the etiology of the Summer Diarrheas.

Summer Diarrhea of Infants as a disease sui generis, dates from the appearance of Benjamin Rush's paper in 1777, entitled: "An Inquiry into the Cause and Cure of The Cholera Infantum." The disease seems to have been unknown to the Indians, and very early settlers, possibly as Brooks suggests, because physicians had very little chance to study such disorders and obtain statistics as to their frequency. Digestive disturbances in children were looked upon as ailments that had to occur, and could be treated by old women and ignorant nurses. That the disease was known to the ancients, is shown by references to it in works dating from the 2d century, A.D. It was recognized that the summer time was not only the season of greatest incidence, but also of greatest mortality.

It seems curious then that it was not until nearly the beginning of the 19th century that the disease received attention. After the publication of Rush's paper, it was nearly half a century before the physicians of Europe recognized the importance of the disease. It was supposed to be peculiarly an American disorder, and was said to occur only sporadically in Germany, France and England.

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Various factors were blamed as causes of the disease. It was thought that the atmospheric temperature alone, a mean of 60 degrees F., was sufficient to cause an epidemic. Some looked on teething as the chief cause, as in most cases the disease was preceded by the diarrhea of teething. Others saw in the food of the infants the primary factor in the disease. Very naturally the views that prevailed before the Bacteriological era of modern medicine with regard to epidemics in general were also believed to hold good for the Summer Diarrheas. With the discovery of bacteria, and the development of the bacterial origin of disease, new ideas began to creep in among the old views as to the causes of Summer Diarrhea. To Escherich in Vienna, and Booker in Baltimore, is due all praise for the first careful work on the bacteriology of the stools of infants with Summer Complaint. Each observer separated out a number of organisms, mostly bacilli, allied to the colon group of bacteria, to no one of which, however, could either investigator claim absolute specificity. In fatal cases streptococci were practically always found. Some have tried to separate a special streptococcic diarrhea, but it is certain now that the cocci are terminal invaders, as they are in many other affections.

Fresh vigor was put into the subject of dysentery in 1898 by the discovery of Shiga, a Japanese investigator, of the specific organism concerned in tropical epidemic dysentery in Japan, the B. dysenteriæ. Flexner and Barker of Manilla, Kruse in Germany, found similar organisms in epidemics of dysentery and confirmed Shiga's results in general although disputes arose as to minor differences in races or strains of the organism. These points, however, can not be discussed in the limits of this paper. Suffice it to say that not only in tropical epidemic dysentery was this organism constantly present in the stools, and showed the specific agglutination with sera obtained from patients ill with the disease, but it was also found in sporadic dysentery, and in the terminal dysentery of asylum patients.

Bacteriologists, especially in America, then turned their attention to infants in the hope of throwing some light on diarrheal diseases with the help of the new technique developed in the search for the dysentery organism. Flexner, at that time (1902) Professor of Pathology in the University of Penn., sent one of his pupils, Duval, a man who had had considerable experience in the specific technique, to the Thomas Wilson Sanitarium near Baltimore, Md. The opportunities for studying cases of diarrhea were excellent. The previous summer (1901), during the writer's service, over 400 infants and young children were admitted, the large majority of them suffering from diarrhea. Duval tried first agglutinations with the blood serums of babies ill with diarrhea on known varieties of dysentery bacilli, cultivated from the stools of adult patients. The agglutinations were marked, rapid and occasionally in very high dilution. He and Bassett succeeded during the summer of 1902 in obtaining bacilli in 42 out of 45 cases. The bacilli could not be obtained from stools of healthy children, or those suffering with other diseases. This discovery started other investigations on the same lines, and confirmation of the work was not long in coming forward. At first the bacilli were isolated only from bloody mucous stools or stools containing a great deal of mucus. However, with improved technique and experience with the organism, the bacillus was obtained from cases showing only small traces of mucus. In fact Duval was in the habit of saying that he thought that in any diarrheal stool containing even a very small amount of mucus, the dysentery bacillus could be found.

The results of the collective investigation under the auspices of the Rockefeller Institute for Medical Research carried out in certain eastern cities during the summer of 1903, has confirmed the work of Duval and Bassett. Hastings in Boston; Duval and Schorer, Wollstein, and Cordes in New York; Bassett in Baltimore, have succeeded in obtaining the bacilli in a large proportion of cases. The specific agglutinations in these cases were always present. The evidence then goes to show that Summer Diarrhea is a very definite condition caused by one organism, viz., the B. dysenteriæ Shiga.

That other factors are concerned as well in the production of the disease is conceded by all. As in every infectious disease the soil must be ready to nourish the seed. It is of course possible that the B. dysenteriæ may lead a saprophytic existence in the intestinal canal until conditions occur which allow of its rapid multiplication. The possibility, however, of finding a dysentery bacillus among the billions of other organisms in the feces, is remote enough to be absolutely impossible. One observer claims to have found dysentery bacilli in the stools of healthy children during an epidemic of dysentery (Strong). So far as I know this is an observation that has not been confirmed.

The term Summer Diarrhea is in a certain sense a misnomer, as the disease with all its characteristics occurs throughout the year, in short where the conditions are fulfilled for the production of the disease, the two essentials being a suitable intestinal tract and the dysentery bacillus. It is, however, in the summer that the various factors, that make up the accessory conditions for the development of an epidemic, are more potent. Then it is that milk is more apt to be badly contaminated, it alone being able to set up digestive disturbances that prepare the soil for the dysentery bacilli. There can be no question too, that the depressing effect of a high atmospheric temperature is a powerful accessory factor in the production of the epidemic that occurs in July and August of every year in the large cities of our continent.

The highly interesting and instructive report of Drs. Park and Holt, shows very conclusively the influence of impure milk, lack of intelligent care, dirty surroundings and high temperature on babies in the New York tenement districts. They say: "It was practically the unanimous opinion that the most important factor in securing good results is intelligent care. This covers merely: clean bottles and nipples: the willingness and ability to carry out directions as to methods of feeding, quantities, frequency, the stopping of milk at the first signs of serious diarrhea, etc.; proper care of the milk itself while in the house, and methods of sterilizing; suitable clothing and cleanliness of the children, and as much fresh air as possible. Most of the physicians stated that, leaving out the very worst store milk in summer, the results were much less affected by the character of the milk, than they had anticipated, and distinctly less than by the sort of care the infants received.

"The surroundings alone had much less influence on results than was anticipated. For not only were breast-fed infants found doing well under the most unfavorable surroundings, but those also who received only the bottle as a rule did well, provided they received intelligent care and good milk.

"The depressing effects of great atmospheric heat, i.e., a temperature in the neighborhood of 90 degrees F. or over, were very marked in all infants no matter what their food. Those who were ill, were almost invariably made worse, and many who were previously well became ill." It seems highly probable then that the dysentery bacilli are present in the normal intestinal canal. We have not yet reached the bottom in our classification and differentiation of allied species of bacteria, hence, it is just possible that the dysentery bacillus, as it grows on suitable living culture media, and the dysentery bacillus living a harmless existence in the intestinal canal, will not grow in a similar manner on artificial media, under artificial conditions. Who can say positively that of several different strains of colon bacilli cultivated from a healthy stool, one or more might not under favorable conditions, take on the characteristics of the dysentery bacillus, multiply to the exclusion of its fellows, produce its specific toxin, and then be found in such enormous numbers in the stools, that the question of its specificity cannot be doubted. The writer believes firmly that a bacillus capable of producing the clinical symptoms of dysentery and presenting the cultural characteristics, as we now know them, on artificial media of the dysentery bacillus, is a normal inhabitant of the large intestine.

To come back to facts, we have as the result of the most recent work, the following brief summary. The B. dysenteriæ is the specific organism concerned in the disease. It is found in every case when blood and mucus are in the stools, in every case where there is mucus present (Duval); in the large majority of cases where mucus is present in appreciable quantities (Wollstein, Hastings, etc.). It is not known positively whether the B. dysenteriæ is present in the healthy intestine. Possibly it is. It may be taken into the intestinal canal in the unboiled water used to dilute milk for feeding (Bassett). It may possibly be in the milk. As most milk is now sterilized or Pasteurized, before feeding, the danger from that source is minimized.

The symptomatology and pathology are now so well known, that I shall pass over them. Just a word, however, as to some of the newer pathology. The B. dysenteriæ as a rule is not found in the internal organs. The disease does not seem to be a general bacterial disease, like typhoid fever, with localized intestinal lesions. Dysentery seems to be a disease due primarily to the absorption of toxins from local bacterial growth. The injection of the toxins into the skin causes, besides a rather marked local reaction, fever, headache, prostration, but no diarrhea. Howland has recently described four groups of lesions of the intestine due to B. dysenteriæ, from the simple hyperplasia of lymphoid tissue to the pseudo-membranous form, in which he describes the false membrane as formed of necrosed tissue, of cellular debris, and masses of bacilli.

Prophylaxis.—Much can be done to protect infants from diarrheal diseases. The success attending the persistent efforts of the New York City Board of Health, shows that, however bad the surroundings, and however ignorant the mothers, by persistent efforts, the sickness and mortality can be markedly lowered. Most important of all as quoted above is intelligent care. By this we mean cleanliness in the child and his clothing; attention to the mouth, to the amount and kind of clothing worn by the infant. Babies should be dressed to suit the atmospheric temperature. How often have we seen puny babies so overloaded with clothes that it seemed impossible for them to breathe?

Napkins should be changed as soon as soiled, and in institutions, where many babies are, they should be thrown at once into some antiseptic solution. We can no longer question the fact that infection can be carried from one infant to another by a third person. It is possible that flies play some part in spreading the infection.

Any mild intestinal upset should be immediately cared for. To look on an irregularity of the bowels as something that must occur with the eruption of every tooth is, in summer, to jeopardize the life of the baby. No diarrheal condition in summer is trivial enough to be passed over as teething, or the like.

It can be laid down as a rule from which there are no exceptions that diarrhea in warm weather is always a serious condition.

It goes without saying that if the baby is artificially fed, the milk should be of an approved standard, and the bottles and nipples should be kept scrupulously clean. It is bad practice to wean a baby during or just before the beginning of summer. Another important point to remember is that in hot weather the tendency is to over-feed, and to give too little water. A fretful child may have cooled boiled water frequently, but the feedings must be as regular as the clock. Fresh air is of the utmost importance. Children should be taken to the country whenever possible. Even day excursions have proved to be of great benefit. It is after all intelligent care, with all that it implies, that has lowered the mortality and sickness among babies.

Treatment.—In the treatment of diarrhea in a child the point to be kept in mind constantly, is that there is some irritation in the digestive tract. Where irritation is, it must, if possible, be removed immediately, before anything else is done. What was the primary cause of the infection should be sought for, and means taken to keep away the agent.

We may divide the treatment of Summer Diarrhea, for convenience of description, into: (a) Hygienic; (b) Medicinal; (c) Mechanical; (d) Specific.

(a) We have already spoken of the care that must be exercised to prevent the infection of babies. It is only necessary to remember in the hygienic treatment that we are dealing with an infection of the intestinal tract primarily. The infectious agent is in the stools, and from there can be carried to other children. Attention to the minutest details in cleanliness and care is all-important. Infants should be lightly clothed, kept if possible out in the open air, should sleep in a well ventilated place Napkins should be changed as soon as soiled, and the buttocks bathed in some antiseptic solution, then powdered with a sterile powder.

(b) The first thing to do when called to see a child in good condition, who has a history of 15 to 20 stools in the past 24 hours, is to give a purge. Under no conditions should the attempt be made to "check" the diarrhea by giving opiates.

Babies are killed, not cured by such treatment. The diarrhea is an evidence of irritation. The intestines by hurrying onward their contents seek to throw off the harmful products, and while they may be able to do it unaided, it is always the part of wisdom to assist nature. Either calomel in divided doses until purgation is free, or large doses of castor oil can be given. If there is vomiting and nausea, the calomel is probably to be preferred. The next step is to stop all milk for at least 24 hours. Children at the breast should not be allowed to nurse for that time. It is better to give nothing but boiled water. That is, however, a difficult matter for a mother to consent to do. An excellent plan is to give weak tea. The little caffein acts as a mild stimulant, and the anxious mother's fears of starving the baby to death are as a rule satisfied. The following day, if the diarrhea continues, after we are sure the purge has acted well, some intestinal astringent may be given. In the writer's experience no drug is better than bismuth subnitrate. With this may given paregoric or deodorized tincture of opium. Tannigen et al may be used, but none of the preparations recently introduced are any better than bismuth. It goes without saying that strychnin, camphor, brandy, digitalis and other stimulants must be given as required.

(c) Under this heading we include irrigation of the stomach and bowel, and baths and packs. If an infant is seen in the very beginning of an attack, when the vomiting is extreme, it is good practice to pass a soft tube down the esophagus and wash the stomach with luke warm water. I have never known a baby so collapsed at outset that this could not be done if care were exercised, and I have never seen any harmful effects follow stomach lavage. At times it is well to irrigate and wash the colon at the same time. Castor oil or calomel can be put directly into the stomach through the tube. The stomach lavage is frequently the best means we have of stopping constant retching and vomiting.

If by the fourth or fifth day of illness, the stools still contain mucus and undigested material, and are from 4 to 8 a day, colon irrigation can be used to advantage. This is best done in the following manner. The nurse holds the infant's head to the left, on her lap. She rests the right foot on a stool so the child's buttocks are elevated. With the left hand she holds a rubber sheet around the child's waist, and so arranged that it protects her clothes and drains off into a bucket at her right side. With the right hand she holds the child by its ankles. For irrigation one uses a fountain syringe and a soft rubber catheter, about No. 20 French. A piece of glass tubing makes the connection between the catheter and the tube of the syringe. As irrigating fluids one can use warm normal saline, sodium bicarbonate (℥i-Oi), or various astringents. If there is much mucus, one should use the soda solution, as that dissolves the mucus and more effectually cleanses the mucous membrane. The child is firmly held by the nurse, so that the head is much lower than the buttocks, and the catheter, well oiled, is passed into the rectum. It soon reaches the sharp bend of the sigmoid flexure. Now by carefully allowing water to run in and distend the gut slightly the catheter can be readily passed up the descending colon, even to the transverse colon. With the catheter in as far as it will go, care being taken it is not doubled on itself, the flow is started. The colon is filled, the position of the child allowing the water to flow up the colon, the flow stopped, the catheter disconnected at the glass joint, and the contents of the gut allowed to flow out. As the irrigation proceeds, the catheter is turned from side to side and gradually drawn out, so that the colon gets a true washing. Irrigation is done until the return flow comes away clear. Irrigation at first may be done twice a day, later once in two days.

For the fever and irritability, warm full baths can be given, also sponge baths with cold water, or dilute alcohol. If collapse supervenes, the mustard bath is an excellent general stimulant. Subcutaneous saline infusions can be given in the tissues of the breast or buttocks. I must confess I have never seen a case that I considered saved by saline infusion, nevertheless I always use it, sometimes early, sometimes late in the disease.

(d) When the cause of Summer Diarrhea was discovered, it was fondly hoped that we might be able to immunize animals and obtain a curative serum. Experiments made on laboratory animals showed that the serum from a horse, which had received for a period of nine months to one year increasing doses of virulent bacilli, would protect against fatal doses of the dysentery bacillus. Also it was found that if the animal were inoculated with a fatal dose of bacilli, and later given antitoxin the animal could be saved in many cases, if the curative serum was not too long withheld. In Japan Shiga had already prepared a horse serum, and had found that the serum when given to patients suffering from dysentery caused a rapid amelioration of all symptoms, and seemed to be a specific for the disease. Rosenthal has recently published from Gabietchewski's clinic, a series of cases treated with serum. The results were all that could be desired. Cases also in this country were treated, especially asylum dysentery, with most satisfactory results. It seemed then that we had at last found a specific for Summer Diarrhea Trial was made, but the results cannot be said to be brilliant. The experience of La Fétra and Howland, and the writer in New York, of Hastings in Boston, and of Knox in Baltimore, during the summer of 1903, showed that while in some cases the serum seemed to do good, in other cases and those the very cases where we looked for results, it did no good. So many factors enter into the question of infant disease, that it is hardly right to expect too much of one cure. The intestinal tract is diseased, and the problem is complicated by the question of nourishment. Suppose we do neutralize the toxines of the dysentery bacillus. There is still the problem of feeding the child, which is ever before us and the chance of secondary infection is great. In at least one case I saw last summer in a child 2½ years old, who became suddenly ill with loose stools that soon became bloody and mucous in character, 10 cc. of serum apparently stopped the dysentery and the acute symptoms in less than six hours. By the following day the stool was fecal in character, and by the third day the stool was normal. Could we be sure that all our cases were uncomplicated dysentery bacilli infections, we could hope for much from the serum. Unfortunately in infants it is no simple infection. The serum does, however, no harm. I have given 20 cc. at one sitting to a child nine months old, and to one child of the same age over a period of ten days I gave 150 cc. I saw no bad effects of any kind. Others so far have seen none. It is well I believe in cases that begin furiously, and soon show bloody mucous stools, to use the serum at once. Such cases even in infants may be helped. As a rule, however, these cases are not as common as the cases with diarrhea for a week to a month, then blood and mucus in the stools, a sign of ulceration of the bowel. Further trial of the serum is urgently needed before any very definite conclusions can be drawn. The above are only impressions gained by using the serum on a few cases. It is to be hoped that further experimental work will produce a more potent serum. At present one has no idea how many units he is using when he injects 10 cc. Possibly a concentration of the serum will give us the results we are looking for. In the meantime we can do a great deal to prevent Summer Diarrhea by careful supervision of our municipal milk supply, our water supply, and by instructing mothers in the care of the infants Then should, in spite of our precautions, the disease break out, we must treat it energetically with the means at our command.

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SANITARY SUPERVISION OF THE [illegible] AND MARKETING OF MILK[1]

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The importance of pure milk for the community is just beginning to receive popular recognition, as shown by the organization of milk commissions in the different cities, by the philanthropic movement to supply pasteurized milk free of cost for the infants of the poor in several large cities, and by the announcement on the wagons of the milk dealers that they serve "certified," "pasteurized," or "sterilized" milk.

Those of us who have long and repeatedly urged the importance of improved sanitary measures for the collection and marketing of milk, especially that which is intended for infant feeding, should feel greatly encouraged by these signs of the awakening of the general public to a realization of the necessity for improved conditions. It is entirely a question of educating the public to the point of demanding pure milk, and, when this has been accomplished, it will be merely a matter of time when the desired improvement in the condition of market milk will be consummated.

The importance of a pure milk supply for infant feeding becomes apparent when we realize that probably one-half of all infants born in our large cities are deprived of mother's milk and must be nourished with artificial foods, of which cows' milk is by far the most important substitute for mother's milk. Prof. Dunbar[2] estimates that 2,000,000 infants are born annually in the German empire, and that at least one-half of these are raised on cows' milk. He states that of the children raised by means of artificial foods 150,000 die each year as the result of using impure milk. The statistics of our large cities afford no information as to the relative number of infants deprived of mother's milk, but the excessive death-rate among infants under one year of age, from such diseases as cholera infantum, diarrhea, inanition, inflammation of the stomach and bowels, and marasmus, most of which are more or less directly due to faulty nutrition, warrants the assumption that a large percentage of these deaths is due to the use of impure milk for infant feeding.

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[1] Read before the Montgomery County, Pa., Medical Society, April 27, 1904.

[2] Deutsche Vierteljahrschft. f. oeff. Gesundheitspflege, 1904, Bd. xxxvi.

THE BACTERIAL CONTENT OF FRESHLY-DRAWN MILK

In order to comprehend the influence of present methods of collecting and marketing milk upon the bacterial content of the milk it will be necessary to examine into the condition of the milk as it comes from the cow's udder. A very large number of observations have shown that it is often difficult to obtain milk from the udder that is free from bacteria.

The fore milk always contains some bacteria which have gained entrance to the orifice of the teat, frequently penetrating into the milk cistern, where they find conditions favorable for their multiplication. By discarding the fore milk it is possible to secure sterile milk in about 30 per cent. of healthy cows.

The following table, taken at random from a large number of examinations of milk drawn under precautions, shows the bacterial content of milk derived from cows in one of the best dairies of Pennsylvania:

TABLE I.

Number of sample	Number of bacteria per c.c.
238	25
242	0
246	16,300
250	75
258	0
263	675

In another dairy, in which the sanitary conditions are nearly as satisfactory as in the first, the results shown in Table II. were obtained:

TABLE II.

Number of sample	Number of bacteria per c.c.
293	150
295	3,400
300	8,325
305	0

These results show that milk collected directly from the cow is usually not sterile. Frequently cows are encountered in which the milk coming from one of the four quarters of the udder contains very large numbers of bacteria, though no disease of the udder is demonstrable, while the milk derived from the other quarters may show relatively few bacteria.

The results obtained with the milk from each of the four quarters of the udder collected separately are shown in the following table:

TABLE III.

Quarter of the udder	Number of bacteria per c.c.
Right front	0
Left front	34,400
Right hind	925
Left hind	575

In another cow somewhat similar results were obtained, as shown in Table IV.:

TABLE IV.

Quarter of the udder	Number of bacteria per c.c.
Right front	550
Left front	175
Right hind	0
Left hind	6,950

In cows which had suffered sometime previously from catarrhal inflammation of one or more quarters of the udder, the number of bacterial in the milk of the infected quarter was usually so great as to preclude their enumeration by the methods ordinarily employed. Table V. shows the results obtained with the milk of such a cow in which all signs of the inflammation had subsided and the owner believed the animal to be in a sound and healthy condition.

TABLE V.

Quarter of the udder	Number of bacteria per c.c.
Right front	2,700
Left front	150
Right hind	Innumerable
Left hind	24,800

In the ordinary operations in the dairy, of milking, straining, cooling and bottling of the milk, there is abundant opportunity for the entrance of other bacteria into the milk besides those coming from the orifice of the teat and from the milk cistern. The most fruitful source of bacteria gaining access to the milk in the dairy are the various utensils used in collecting and storing the milk. The number of bacteria gaining access to the milk from the utensils is in direct proportion to the degree of cleanliness of the utensils.

The extent to which bacteria gain access to the milk during milking and cooling in a dairy in which the greatest possible care is exercised with regard to the cleanliness of the udder and all the milk utensils is shown in Table VI., in which the milk is followed from the cow to the final container:

TABLE VI.

Source of sample	Number of bacteria per c.c.
Bucket	50
Can	4,050
Strainer	3,100
Cooler	3,900
Tank below cooler	9,875

It will be seen that here there is a more or less gradual increase in the number of bacteria with each utensil with which the milk comes in contact. In another dairy, in which the conditions were not as satisfactory, and in which less care was taken in cleansing the various utensils, the results obtained are far from satisfactory:

TABLE VII.

Source of sample	Number of bacteria per c.c.
Udder	400
Bucket	850
Strainer	60,900
Cooler	34,500
Tank below cooler	173,600
Bottler	84,000

That the large number of bacteria encountered in the milk is derived from the different utensils is shown not only by the fact that there is a more or less constant increase in the number of bacteria with each utensil with which the milk comes in contact, but also by the fact that after from fifty to one hundred quarts of milk have passed over the straining, cooling, and bottling apparatus, the number of bacteria derived from these sources is very much diminished. In Table VIII. are shown the results obtained with samples of milk collected from the utensils, yielding the results shown in Table VII., after about one hundred quarts of milk had passed over them:

TABLE VIII.

Source of sample	Number of bacteria per c.c.
Strainer	3,350
Cooler	3,250
Tank below cooler	5,850
Bottler	4,750

Other sources of bacteria in milk, besides the various utensils, are: cow's udder and fur, the hands and clothing of the milker, and dust in the air of the stable and milk house. The number of bacteria gaining access to the milk from the cow's udder and fur is in direct proportion to the degree of cleanliness of the cow and her surroundings. When the cows are carefully groomed each day and the udder and flanks washed with clean water before milking, the number of bacteria gaining access to the milk from these sources is greatly reduced. The same is true for the hands and clothing of the milker. With clean hands and clean clothing far fewer bacteria gain access to the milk from the milker himself.

The number of dust particles in the air of stables is dependent upon several conditions, the most important of which are the arrangements of the stable, its system of ventilation, and the character of the bedding. Stables located in old-fashioned barns with hay-lofts overhead are certain to have an atmosphere laden with dust, and hence favor the entrance of large numbers of bacteria into the milk. Clean bedding yields far fewer bacteria than mouldy hay or straw. The bedding which experience has shown to yield fewest bacteria to the air of the stable is pine shavings.

The amount of dust in the air of the stable is also dependent upon the fact whether the cows have been fed just prior to or during the time of milking, and, also, whether they are fed on dry fodder or on fodder that has been previously moistened.

THE BACTERIAL CONTENT OF MARKET MILK

With the evidence at hand that normal milk usually contains some bacteria, and that even with the greatest degree of cleanliness a large number of bacteria gain access to it from the different utensils employed in collecting and storing milk, and the air of the stable, we would be prepared to find in ordinary market milk somewhat greater numbers of bacteria.

When we come to study market milk at the time it reaches the city, and before it has been removed from the shipping containers, the number of bacteria contained in it is often simply appalling.

In Table IX. are shown the results of some analyses of samples of milk at the railroad depots in Philadelphia during July, 1900. These results are taken in the order in which they stand in the records of routine analyses, and have not been selected:

TABLE IX.

Number of sample	Number of bacteria per c.c.
133	3,042,000
134	1,013,425
135	10,000,000+
136	261,525
137	2,721,600
138	236,400
139	10,000,000+
140	3,704,400
141	43,300
142	10,000,000+
Average	4,802,355+

The average for the ten samples is probably too low, as three of the samples contained too many bacteria to permit of accurate enumeration in the dilutions that were employed. These results are in accord with those obtained elsewhere by bacteriologists, and hence are not unusual, as shown by the following figures, representing the numbers of bacteria found in market milk in other cities:

New York	4,000,000
Boston	2,300,000
Chicago	2 350,000
Baltimore	4,000,000
Wilmington	7,000,000

In European cities market milk has been found to contain even greater numbers of bacteria than have been found in that supplied to American cities, the numbers ranging from 5,000,000 to 10,000,000, and frequently 20,000,000 to 180,000,000 bacteria per c.c. have been found.

Such very large numbers of bacteria in market milk are traceable to gross negligence in the collection and storing of milk. They indicate not only great lack of cleanliness in the dairy, but likewise unsatisfactory conditions during the shipment of the milk. Milk is such a favorable medium for the development of most bacteria that they increase enormously whenever the temperature of the milk is not promptly reduced to about 40 degrees F. and maintained at such a low temperature during shipment.

THE NATURE OF THE BACTERIA IN MILK

Systematic study of the nature of the bacteria in milk as it comes from the udder shows that while a large number of species are encountered only a few species are encountered with any degree of constancy or in very large numbers.

The species of bacteria which appear to be present in freshly-drawn milk in relatively large numbers are staphylococci, streptococci, and the bacillus pseudodiphtheriæ. These are organisms which are concerned in the production of inflammatory reactions, and hence one or several of these species is present in all udders in which there is a catarrhal condition. This catarrhal condition is frequently so mild in character as not to be suspected by the attendants. The bacteria persist in the udder for a long time after the subsidence of an attack of mammitis, and hence it is probable that whenever they are encountered in large numbers the cow has at some time previously suffered from mammitis. Comparative tests have shown that frequently only one-quarter of the udder yields milk which contains large numbers of these bacteria, and this fact supports the opinion that their presence indicates that the cow at some time previously suffered from mammitis.

When several cows in a dairy yield milk which is rich in bacteria as the result of a catarrhal condition of the udder, it is not surprising that the mixed milk of the herd has a high initial bacterial content. If, in addition to this, we have gross neglect of ordinary measures of cleanliness with regard to the milking and the various utensils used in collecting and storing the milk, the number of bacteria in the mixed milk may easily reach many millions.

The nature of the bacteria gaining access to the milk during milking and from the various utensils is mainly of a twofold character: the lactic-acid bacteria and putrefactive bacteria. The former class thrive best at a relatively high temperature, 60 degrees to 80 degrees F., while the latter class thrives also at lower temperatures. Consequently the temperature at which the milk is maintained favors the development of the one or the other group of bacteria. At the higher temperature the lactic-acid bacteria soon outgrow the other and render the milk acid, while at the lower temperature the putrefactive organisms gain the upper hand and render the milk putrid, though this change is brought about much more slowly than the production of acid.

The lactic-acid bacteria consist of several varieties, such as bacillus acidi lactiti, bacillus lactis, micrococcus acidi lactici, and bacillus coli communis. The putrefactive bacteria in milk are the bacillus proteus, bacillus alkaligines, and others.

SANITARY MEASURES IN USE FOR THE COLLECTION AND MARKETING OF MILK

Those in Use by the Producer.—The sanitary measures which have been introduced into a few of the dairies in proximity to the large cities have demonstrated the possibility of collecting and marketing milk that is far more satisfactory than that collected under former conditions. These measures include improved stables and milk-houses, systematic grooming of the cows, sterilization of the milk buckets and containers, the rapid cooling and bottling of the milk at the farm, and the shipment of the milk in the summer in special containers surrounded with ice so as to maintain its low temperature.

These arrangements entail great expense and constant vigilance on the part of the attendants, and have resulted in raising the price of milk to the consumer. The latter fact alone has prohibited the promulgation of a demand that all milk exposed for sale in large cities be collected and marketed under similar conditions.

The milk derived from dairies conducted under these improved conditions usually meets with the requirements of the several milk commisisons which have been organized in some of the large cities. The bacteriological requirements of pediatric milk are that the number of bacteria contained in it shall be less than 10,000, and usually it is much lower than this figure. It is, however, not to be expected that all producers of milk can meet the requirements of the several milk commissions and produce a milk having less than 10,000 bacteria to the cubic centimeter when it reaches the consumer. In New York City and Buffalo, and probably in other large cities, the efforts to improve the condition of milk in general have led to the adoption of a bacteriological standard to which all milk will have to conform, that is, a bacteriological content of less than 100,000 per c.c. Such a standard, while relatively high, as judged from a purely sanitary aspect, will, however, assist very materially in improving the conditions in many of the dairies of the country. It is believed that the intelligent farmer will make every effort to meet any reasonable demands made upon him in this respect, and where hygienic surroundings are maintained and a satisfactory degree of cleanliness of all utensils can be produced, and moreover when satisfactory shipping conditions are to be obtained, that is, shipment in refrigerator cars, there is no doubt that milk having less than 100,000 bacteria per c.c. can be marketed.

Measures in Use by the Distributer.—The sanitary measures recently introduced by some distributers of milk in large cities consist in the installation of large pasteurizing plants for the pasteurization of the milk as soon as it is received from the producer. These measures have not always increased the price to the consumer, though they entail extra labor and expense upon the distributer, which lessens his profits and, indirectly, that of the producer.

During the past five years, since apparatus for the pasteurizing of milk on a large scale has come into use, various forms of apparatus for the pasteurization of milk have come into the market. Some of the apparatus on the market is not well adapted to the intended purpose, because it is not readily controlled. The degree of temperature to which the milk is heated and the length of time of time during which the temperature is maintained are of the greatest importance. If the temperature is too high or maintained too long the taste of the milk is altered to some extent, so that it may be objectionable to invalids and infants. If the temperature is too low or maintained for too short a time it fails in part of its intended purpose, that is, the destruction of bacteria.

Frequent analyses of so-called pasteurized milk have shown that it may contain very large numbers of bacteria, and hence is unfit for infant feeding. In a recent test of the efficiency of a pasteurizing apparatus on trial by a distributer the raw milk was found to contain 5,040,000 bacteria per c.c., while the same milk heated (presumably) to 160 degrees F. contained 110,080 bacteria per c.c., a reduction of 97.8 per cent., but still containing a number of bacteria which is far in excess of clean milk.

Another pasteurizing apparatus tested yielded the following results: Raw milk, 538,250 bacteria per c.c. When heated to 160 degrees F., 2,220 bacteria per c.c., equal a reduction of 99.58 per cent. When heated to 165 degrees F., 1950 bacteria per c.c., equal a reduction of 99.63 per cent.

These results are far more satisfactory than those obtained with the first apparatus, and when kept under proper conditions of temperature such a milk should have keeping qualities equal to the best "certified" milk.

A temperature of 160 degrees to 175 degrees F. maintained for half an hour is regarded as sufficient to destroy all dangerous bacteria that may be in the milk. In herds free of tuberculosis the lower temperature will be sufficient, but in herds that have not been tested with tuberculin the higher temperature would be preferable in order to render the milk safe. The lower temperature will be sufficient to destroy the staphylococci and streptococci coming from the cow's udder, as well as the organisms of diphtheria, typhoid fever, dysentery, or cholera, should they accidentally gain access to the milk.

If the pasteurization of milk is to be encouraged it should be insisted upon that no milk be pasteurized that is more than twelve hours old. Whether such a regulation could be enforced is somewhat doubtful. The Berlin milk regulations require that no milk that is more than twelve hours old shall be used for the preparation of sterilized milk. The principal reasons for such a requirement are: that milk that is more than twelve hours old, unless collected under the best hygienic conditions and stored and shipped in sterile vessels, will contain such large numbers of bacteria that the sterilization or pasteurization will fail to bring the number of bacteria to a sufficiently low limit. Moreover the large number of bacteria contained in such milk will have produced injurious if not poisonous metabolic products in the milk when kept for more than twelve hours. These metabolic products of the bacteria in milk may produce severe forms of toxic poisoning in infants fed on such milk, and it is probable that the grave gastrointestinal disturbances in infants in summer are frequently due to such poisons in milk. When these metabolic poisons have once been formed in a sample of milk they cannot be removed by pasteurization, neither can the normal constitution of the milk be restored. In order, therefore, to prevent the formation of poisonous metabolic products in the milk, and to prevent the destruction of the normal constitution of milk through the agency of bacteria, it is necessary to bring about the pasteurization before the milk is more than twelve hours old. To accomplish these ends it will be best to insist on the pasteurization of the milk before it is shipped to the cities.

THE IMPORTANCE OF PURE MILK FOR THE NUTRITION OF INFANTS AND THE SICK

Reference to Table X. will show that during the past ten years the proportion of deaths in Philadelphia from all causes in persons under one year of age has fallen from 1.857 to 1.548 per thousand births, while the proportion of deaths from gastro-intestinal diseases[3] during the same period has fallen from 0.947 to 0.782 per thousand births. While in 1893 51.01 per cent. of the deaths were due to the gastrointestinal diseases, in 1902 only 50.51 per cent. of the deaths under one year were due to these causes. On the whole, the total number of deaths under one year of age has diminished perceptibly, though the relative proportion of deaths from gastrointestinal diseases and all other causes has not diminished in equal degree. Improved sanitary conditions have undoubtedly served to save the lives of many children, but this saving of life has been more marked for the causes of death other than the gastrointestinal diseases.

These facts show that the sanitary measures heretofore introduced for the improvement of the milk supply have not exercised a marked influence upon the mortality from the gastrointestinal diseases. There is, therefore, abundant room for improvement in the management of infant life, and especially in their food supply. There is no doubt that if a pure milk supply were constantly at hand there would be a marked reduction of the death-rate from gastrointestinal diseases in infants.

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[3] Under gastrointestinal diseases are included cholera infantum, cholera morbus, diarrhea, dysentery, inanition, indigestion, inflammation of the stomach and bowels, and marasmus.

The value of a pure milk supply for sick persons can only be conjectured, as we have no satisfactory data from which to estimate the detrimental influence of impure milk in the nutrition of the sick. The great importance of a pure milk supply for the sick is even not yet appreciated by hospital authorities, or is neglected for financial reasons, as not all hospitals insist upon obtaining the best grades of milk.

TABLE X.

Year.	Births.	Deaths under one year.		Deaths (per 1000) of children under one year of age.		Per cent. of all deaths under 1 year due to gastrointestinal diseases.	General death-rate.
		All causes.	Gastro-intestinal diseases.	All causes.	Gastro-intestinal diseases.		
1893	30,737	5.710	2,913	1.857	0.947	51.01	21.20
1894	31,226	5.472	2,842	1.752	0.909	51.93	19.90
1895	29,838	5.486	2,724	1.838	0.912	49.65	20.44
1896	29.753	5,550	2,643	1.865	0.888	47.62	20.17
1897	29,591	4,657	....	....	....	....	18.72
1898	20,090	5,036	....	....	....	....	19.18
1899	28,441	4.561	2,227	1.600	0.783	48.93	18.78
1900	29.105	5,046	2,568	1.733	0.813	50.89	19.28
1901 ...	28,215	4,644	2,554	1.645	0.905	54.99	18.26
1902	29,841	4,622	2,335	1.548	0.782	50.51	17.67

Note—The statistics for the years 1897 and 1898 are not supplied in the reports of the Bureau of Health for those years.

SOME REMARKS ON TUBERCULOSIS IN CHILDREN WITH REPORTS OF TWO TUBERCULOUS AND TWO NON-TUBERCULOUS CASES THAT ILLUSTRATE POINTS IN DIAGNOSIS

By Robert H. Babcock, M.D., of Chicago

Instances are so numerous in which I am called on to examine young children suspected of being tuberculous that I have decided to emphasize a few facts which although well known appear not to be generally remembered by physicians when requested to pass on the condition of a child's lungs.

That tuberculosis is of frequent occurrence in children under ten years of age is plainly shown by statistics. Thus according to Cornet, Simonds, Schwer and Bolz found out of 2,447 autopsies on children under ten years, dead of all diseases, 362 instances of tuberculosis, or 22.93 per cent. Divided up into smaller periods the figures were as follows: 4.5 per cent. were tuberculous under one year; 20 per cent. from 1 to 5 years and 35 per cent. between the ages of 5 and 10. Mueller's percentages likewise given by Cornet are as follows: Of 426 autopsies under the age of ten 115 or 23.36 per cent. were tuberculous and of these 6.1 per cent. fell under one year; 26.8 per cent. from 1 to 5 and 37.2 per cent. between the ages of 5 and 10.

Jacobi states that in ten hundred and forty-five autopsies made in the New York Foundlings Hospital (Northrup) and the Babies Hospital, "tuberculosis was found in fourteen per cent.: altogether one hundred and nineteen cases." These and similar statistics demonstrate the frequency of tuberculosis in infancy. "From the first to the fifth year it is the same."

Holt states that of 500 autopsies on children in Munich, Mueller found 40 per cent. tuberculous, a higher percentage, Holt thinks, than exists in this country, as shown by the statistics cited by Jacobi.

The relative frequency with which the various organs are affected is also interesting and instructive. Not to weary you with figures it may be stated in a general way that in young children the primary seat of tubercle is in the bones, joints and lymph glands (Jacobi). That the lungs eventually become affected is shown by Holt's figures, viz., of 119 autopsies the lungs were involved 117 times. This is accounted for by the fact that the lungs become diseased secondarily to tuberculosis of the bronchial glands (Fraenkel et al). In a general way, it may be stated that the organs most frequently presenting clinical evidence of tuberculosis are the lymph nodes (bronchial, cervical and mediastinal), the lungs, the cerebral meninges, liver, spleen and kidneys being also frequently involved because of the great frequency of miliary tuberculosis.

In infants, especially under one year, the disease manifests itself by symptoms closely resembling marasmus, and if the lungs become involved, it is secondary to tuberculous invasion of the lymph nodes and in consequence of the antrum of infection being in the intestinal tract. This consideration, together with the observation that the disease invades the lungs through the bronchial glands, at once raises the vexed question concerning the mode of invasion. Jacobi and Brügge, express the belief that the lungs most often become tuberculous through aspiration of bacilli and cite the involvement of the bronchial glands in proof thereof.

Behring on the contrary maintains that the germs gain access through the intestinal tract, consequently by the food and not by respirated air. The infection may remain dormant for many years and declare itself after the individual has suffered a reinfection. His opponents argue that were the intestines the avenue of entrance bacilli should be discovered in them, which they never have been. Ravenel's experiments on fasting dogs, however, appear to prove conclusively that tubercle bacilli may be absorbed from the intestines and pass directly into the chyle and mesenteric lymph glands, leaving the intestinal walls free.

By whatever route the bacilli reach the bronchial and intrapulmonary lymph nodes, it is the fact of their predominant involvement in young children, which explains the clinical appearances.

Under the age of 7 and especially 5 the bronchial glands are the chief, and according to Fraenkel, the earliest seat of the affection. From here out, favored by inflammatory adhesions of the pleural surfaces the disease spreads, not to the apex as in adults, but to the middle portion of the lung and to the lower lobe.

Involvement of the lower lobe is sometimes brought about also by penetration of a bronchus by a caseous gland, and the aspiration of its cheesy contents into the lower portion of a lung. The preference of the tubercular process in young children for the parts of the lung surrounding the hilus is explained in part by Birch-Hirschfeld by the fact that in them the direction of the bronchus leading to the apex is less vertical and that the greater mobility and elasticity of the thorax favors more energetic respiratory movements, and hence better ventilation of the apex. Certain it is at all events, that in children under 7 and still more under 5 the apices are not the areas of predilection in which to look for changes due to tuberculosis.

Relative to this recognized fact Jacobi says in effect that when dullness and bronchial breathing are found at the apex of a young child, they are generally due to a chronic interstitial thickening, which dates back to some former attack of bronchitis. Accordingly, when pulmonary tuberculosis is suspected in a child of tender years, it is not the apex to which attention is to be especially addressed, but the bronchial gland area, situated at the back between the second and fifth dorsal spines, the middle lobe on the right side, the middle portion of the left lung and both lower lobes One is also to study the condition of the lymph glands, in particular the cervical and mediastinal, and to look for localized or unilateral diminution or suppression of breath sounds which may suggest caseation of some of the intra-pulmonary bronchial nodes and compression of a bronchus.

This investigation of the lymph glands is of the utmost importance since tuberculosis of the lungs in these young patients is in the overwhelming majority of cases, secondary to glandular tuberculosis.

Another consideration of the very greatest clinical significance is the liability of young children to miliary tuberculosis either acute or sub-acute, in which cases the pulmonary signs are very apt to be those of general bronchitis with obscure areas of broncho-pneumonia. In these instances the lymph nodes are the first affected from these. Bacilli, are either discharged directly into the blood vessels through perforation of their walls or are carried by the lymph stream into the duct and by means of it throughout the body.

From the foregoing it is clear that the clinical picture of tuberculosis in children below the age of 5 and perhaps 7 years is likely to be different from that of the adult. The lungs are not the organs primarily affected and hence when these present signs of tuberculous disease, it may be regarded as a comparatively late manifestation of the tuberculosis. I also wish to repeat for the sake of emphasis, that when pulmonary tuberculosis is suspected in children of tender years, examination should not be confined to the apices but must include careful investigation of the middle and basic parts of the lungs and the various lymph nodes so far as they are accessible to examination.

Case I.—In December, 1903, Dr. Kaiser, of Somonauk, Ill., brought to me a farmer's daughter of seven years, who presented symptoms, that rendered him suspicious of tuberculosis. The child had had pneumonia in the January preceding and since then had not been well. She had especially run down during the fall. The symptom which gave especial uneasiness to the mother was cough, which it was stated, was very troublesome at night. The expectoration, if any, was swallowed.

Examination showed a well-nourished girl without fever or respiratory embarrassment. She had a small bunch of adenoid growths and the cervical glands beneath the inferior maxilla were enlarged and indurated. Other glands of the left side of the neck were palpable but small. There was no dullness in the bronchial gland area between the second and fifth dorsal spines. Pulmonary resonance was impaired in the right-supra-scapular region at the left apex both above and below the clavicle and at the left base outside of the anterior axillary line.

Over these areas the breath sounds were harsh and intensified somewhat, but not distinctly bronchial, and there were no rales. In view of the mother's statement that the child had seemed to take cold a week or two before, I was unwilling to pronounce the disease tuberculosis and advised certain treatment consisting largely of open air and the return for another examination if improvement was not satisfactory.

The fore part of April Dr. Kaiser brought the child back with the statement that she had seemed to improve for a time but had shown distinct failure during the past two weeks. Examination now disclosed increase of dullness with bronchial breathing at the right apex behind, slight loss of resonance at the right posterior base, somewhat increased dullness at the left apex and at the corresponding base posteriorly, a considerable patch of pronounced dullness with diminution of breath sounds. No definite rales were detected. The liver was palpable for a distance of about an inch below the costal margin, and I thought I was able to detect the tip of the spleen. Otherwise the abdomen was negative, tenderness not being presented and no lymph nodes being appreciable. A small amount of sputum was obtaind and showed two tubercle bacilli. Temperature was 99.9 F.

These findings placed the nature of the case beyond question. It was one of early pulmonary tuberculosis, but what was the mode of lung involvement? Was the primary infection glandular and that of the lungs secondary? Or had the lungs been primarily invaded through inhalation of bacilli, as Brügge, Jacobi and others believe is the case in opposition to von Behring?

The situation and distribution of the pulmonary signs seem to be contrary to the latter view. In the adult the upper lobe first becomes affected and the process extends from there downward by predelection along the inner borders and down the back more markedly than in the front. In this instance the areas were scattered, the right apex and right base behind, the left apex in front, and the base of the left lung laterally and behind being the areas showing signs of involvement. On the whole therefore the path of invasion seems to me to have been through the lymph channels.

Case II.—Quite different, however, is the case of a thirteen-year-old Jewish girl recently brought to me by Dr. Josephson, of Chicago. This child had been seen by the doctor because of several hemoptyses and a few days thereafter was presented in my office. In this instance there was extensive and pronounced infiltration of the left upper lobe both front and back as shown by dullness and bronchial breathing. Near the right base in front and behind was impaired resonance with diminished broncho-vesicular respiratory murmur. Definite rales were wanting and the temperature was not much elevated. Superficial glands were not much enlarged and there was no dullness in the bronchial gland area.

In this case I am inclined to attribute the slight changes at the right base to aspiration of blood perchance during the hemoptyses, or of bronchial secretions and not to regard them as indicating the glandular mode of infection. This child is old enough to have passed out of early childhood and therefore would be likely to present changes in the lungs similar to such as are seen in the adult.

The next two cases are narrated because their contrast to the foregoing ones appear to me especially instructive. They illustrate also the necessity of a careful history and of a due appreciation from the standpoint of diagnosis of the pathology of tuberculosis in young children.

Case III. February 1, 1904, I saw in consultation a slender boy of 7½ years whose father, a physician, feared tuberculous disease of the lungs. The boy may be said to inherit a predisposition to the disease and had a bad chest development, being narrow chested and stooped. A few weeks previous he had had a sore throat, fever and other symptoms, thought at the time to be grippe. After confinement to the house for a short time, he had again gone to school, been taken with an aggravated recurrence of symptoms and for a second time been kept at home.

At the date of my examination he was still showing a slight temperature from 99 and a fraction to 100 and a few tenths. He had a slight cough and showed impaired resonance and roughened breath sounds in the left intraclavicular and right supraclavicular regions, but not in the bronchial gland area or at the inferior parts of the lung. The submaxillary lymph glands were distinctly indurated, while the cervical and other superficial glands were not palpable. This circumstance taken in connection with the absence of dullness in the bronchial gland area and the history of a recent throat infection lead me to pronounce the slight lung findings not due to

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consider nuary, 1903, a boy of seven years was
of bre m Ohio for diagnosis and advice because of
was pressed by a physician in Cleveland that the
ma ffering from tuberculosis of the bronchial glands.
was well nourished and did not look ill. He had been
reared, spending much time in the open air, but had
good deal of illness in the previous three years. In the
summer of 1900 he had had an attack of abdominal pain followed by a high fever which lasted for a few days and was not understood. The next summer he experienced a similar attack which from the character of fever was pronounced malarial and was treated was quinine. In September, 1902, the boy had a third attack of fever which was ushered in by an obstinate diarrhea, that did not yield to treatment for three weeks. The fever persisted for two weeks longer and was characterized by sudden and marked exacerbations and remissions.

The boy was then taken to Cleveland where examination of the blood for the plasmodium proved negative, but a slight nephritis was discovered. On this account he was sent back home and put on a diet chiefly of milk. In December he was again taken to Cleveland and kept under observation in a hospital. His temperature chart at this time showed a low grade fever which varied from 99 or occasionally 98.4 in the morning to 100.4 and on a few occasions 101 in the late afternoon or evening. Two injections of tuberlin were then administered of which the first was thought to give a slight reaction, whereas the second, of double the dose of the first, failed to show any reaction. Nevertheless the physician expressed the opinion that the child had bronchial gland tuberculosis and should have a change of climate.

My examination disclosed a slight temperature by rectum of 100.2, a leucocytosis of 8,700 and 9,000, perfectly normal ng findings, no induration of superficial glands, no abnormal nges of urine and no fermentation of the feces, but in the t iliac fossa a small body was found which was unmistak- sensitive to palpation, while the abdominal parietes above it, were slightly rigid. This finding was corroborated by Dr. Bayard Holmes who was asked to see the case. It should also be added that this surgeon examined the accessory nasal sinuses and found these perfectly clear to electric light.

Based on the following consideration the diagnosis was made of chronic appendicial inflammation and infection and not tuberculosis of the bronchial glands. These considerations as already mentioned were: (1) the history of attacks of fever and abdominal pain suggestive of some acute abdominal disorder; (2) the persistence of some infection as evinced by slight temperature and slight but distinct leucocytosis; (3) no changes in the lungs; (4) no dullness over the location of the bronchial glands, i.e., in the interscapular regions between the second and fifth dorsal spines; (5) a state of good nutrition.

The history was of utmost importance and significance, but I was especially struck by the boy's appearance, which was that of health, and by the slight increase of leucocytes, since in tuberculosis such an increase does not take place. He was plump and of fairly good color and not at all emaciated as one would expect in a child suffering from glandular tuberculosis.

It may be stated that my diagnosis was amply confirmed by subsequent history. Dr. Holmes ultimately operated and removed a large, long, chronically inflamed appendix, while in the late autumn of the same year the father wrote me that he believed the diagnosis and operation were both fully justified by the subsequent state of the child's health.

MASTOIDITIS IN INFANCY AND CHILDHOOD*

By William C. Braislin, M.D.

SURGEON BROOKLYN EYE AND EAR HOSPITAL

The consideration of inflammations of the mastoid region in childhood involves the necessity of pointing out certain details of the anatomical structure of the ear and surrounding parts which differ materially in infants from the corresponding region in adults.

Anatomical Peculiarities.—The differences found in early life are important from the standpoint of surgical anatomy. They are perhaps of still greater significance in that they indicate the greater ease with which progressive inflammatory processes may extend in infants from the ear and its appendages to the cranial contents. The parts of the brain most likely to be affected by inflammations of otitis origin are of course those immediately adjacent to the petrous portion of the temporal bone; namely, the temporo-sphenoidal lobe, the cerebellum and the large intracranial venous sinuses in juxtaposition.

The relationship between the mastoid antrum and the cerebral contents is more intimate in early life. This is because of the more porous and less resisting state of the bones and the less complete juncture of the sutures. In infancy the petro-squamous suture passes through the roof of the mastoid antrum, the aditus and the middle-ear cavity. Later, coincidently with the enlargement in the size of the brain the horizontal portion of the squamous suture becomes broader, the petro-squamous suture more completely closed, and usually the thickness of bone covering the antrum and typmpanum becomes greater. Broca has noted that while at birth the *tegmen antri et tympani* corresponds to the point of union of the lower and lateral surfaces of the temporo-sphenoidal lobe it becomes in adult life the support of its lower surface only.

The mastoid process undergoes development during childhood. At birth it is scarcely appreciable, as a projection, to the eye or finger. It develops rapidly however. Pneumatic spaces usually appear in the mastoid by the third or fourth year. One may, however, demonstrate soft spaces in the mastoid process at least as early as the eighteenth month. These are the pneumatic spaces in process of formation, and through them infection is readily conveyed. They may be demonstrated, leading away from the mastoid antrum in various directions, outward toward the mastoid cortex, backward toward the posterior surface of the petrous and superiorly as well.

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*Read at a meeting of the Medical Society, County of Kings, Pediatric Section, April 8, 1904.

All parts of the bone are smaller in the infant excepting the middle-ear cavity, the ossicles, cochlea, semicircular canals —in short the essential part of the sound-perceiving apparatus—and the antrum itself. These are nearly or quite as large in the infant as in adult life. Compared with the infantile skull as a whole, the middle and inner ear are consequently larger and occupy comparatively more room in the base of the cranium than in the adult. The middle ear and mastoid antrum lie comparatively superficially, though as in adults, there is a wide variation both in the depth from the mastoid cortex and the size of the antrum, in infants. Surgically considered, operations on infants require appreciably smaller incisions in both the soft parts and in the bone to gain access to the cavities desired. On account of the thinness of bone, in the infant skull, the lateral sinus averages a considerably less actual distance from the antrum than in the adult.

One can not pass from a consideration of the important anatomical differences between the auditory region in infants and adolescence without referring to the inferior width in calibre of the external auditory canal of the former. At birth the upper and lower walls are practically in apposition to one another, and this fact is frequently the cause of imperfect drainage of discharges from the middle ear in young subjects; while swelling of the walls of the canal from sub-periosteal or furuncular inflammations may render the canal practically impervious as a drainway for ear discharges.

Etiology.—The causation of many cases of mastoiditis must be attributed to certain unknown idiosyncracies and dyscrysiæ. It is evident, however, that influences affecting the hygiene of the Eustachian tube and middle ear predispose to mastoid involvement indirectly. Thus adenoid growths of the nasopharynx and other abnormal states of the nose and throat in childhood may be properly regarded as predisposing causes of mastoiditis. Exposure and other conditions generally regarded as productive of acute inflammatory conditions are exciting causes; while the acute contagious diseases of childhood, first, by depressing the vital forces of the patient, and secondly, by directly affecting the mucous membrane of the throat and ear, render the latter susceptible to the attacks of micro-organisms of other species.

In tubercular mastoiditis, conditions of low vitality in the infant combined with unsanitary surroundings furnish the predisposing factors necessary to the successful propagation of the tubercle bacillus in any organ; the exciting cause of its attacking the ear and mastoid is only an object for speculation.

Symptomatology.—In young infants many early symptoms may be overlooked. Thus the first sign of mastoiditis in very young children who are not able to indicate their ailments by speech may be a suddenly appearing swelling just above and behind the ear. This is especially the case when no discharge from the ear has previously existed or has been noticed. In most cases the history is one of a severe type of ear-inflammation with earache and other symptoms, which, instead of subsiding on the occurrence of a discharge, persist and recur, with earache, headache and variable temperature. The discharge from the ear is apt to be profuse, but may be slight or absent.

In the presence of ear symptoms, with or without a discharge, close attention to the temperature chart is of assistance in arriving at a thorough understanding of the individual case. Thus a high temperature (104 degrees or 105 degrees F.) changing rapidly to nearly normal or below and continuing variable is very suggestive of infection of the lateral sinus or jugular bulb.

The following symptoms have been observed in certain obscure cases in which the cause of the infants's illness was uncertain until the diagnosis of mastoiditis was arrived at: Attacks of loud crying, throwing backward the head, fumbling at or pulling at the ear. It may be observed in passing, that children of three or four years may complain of stomach ache when the trouble is really earache. It may be noted that children suffering with earache have a greater tendency to throw the head backward and to burrow into the pillow or against the nurse for the sake of warmth than have children with actual abdominal distress. The latter draw up the knees and squirm with pain. The early symptoms of mastoiditis in infants are largely those of acute middle-ear inflammation and only to be distinguished from the latter by the persistency, recurrence and severity of the symptoms. Symptoms of cerebral irritation occur in the later stages. The eyes may show abnormal reflexes while retraction of the head may indicate an already established meningeal complication. Vomiting or convulsions are likewise an indication that complications secondary to the mastoid inflammation may be present.

Acute inflammation of the mastoid antrum as a complication of middle-ear abscess, if unrelieved, usually proceeds to the formation of:—*Acute sub-periosteal abscess of the mastoid.* When not controlled during its earlier stages, mastoiditis proceeds more or less rapidly—sometimes in a few days, sometimes after several weeks—to the formation of acute sub-periosteal abscess. Infection may take place by pus burrowing beneath the periosteum of the external auditory canal wall, from the antrum and middle ear to the external surface of the mastoid, but is doubtless usually affected by progressive inflammation of the bone spaces between the inner and outer tables, extending until it reaches the mastoid cortex. Although on section of a normal infantile mastoid, one finds that pneumatic spaces, properly speaking, are lacking, yet between the inner and outer tables there exist spongy spaces—the future pneumatic cells, through which infection seems to be readily conveyed from the antrum to other portions of the bone, and by which, likewise, infection may be conveyed to the cranial contents or to the lateral sinus as well as to the outer mastoid surface.

Sub-periosteal abscess of the mastoid makes its appearance usually after several days of pain, restlessness and rise of temperature. Rarely vomiting may have occurred, or even convulsions. A flow of pus from the ear may or may not have occurred.

Swelling appears above, behind, and sometimes in front, of the ear. The ear is pushed downward and outward rather conspicuously, so that the head presents a peculiarly lop-sided appearance. The whole outer ear seems displaced outward and downward. The pain is apt to subside or occurs in shorter paroxysms, with the appearance of the external swelling. The temperature, however, remains elevated or runs an irregular course. The abscess thus formed may dissect the periosteum from the bone in a backward, upward, or forward, direction. Edema may be present in the cheek, over the scalp of the entire side of the head, or even extend beyond the median line; and later, pus may replace the edema. The cellular structures outside the periosteum become edematous, and later, the site of pus collections.

Physical Examination of the Ear.—In examining the ears of infants greater difficulty is met with than in adults. At birth, the upper and lower walls of the external auditory canal are practically in contact with each other and the drum membrane is placed on a nearly horizontal plane. The upper walls of the canal and the drum are thus on a nearly continuous plane, the angle formed by their meeting being very obtuse.

In examining the ears of infants one should pull the lobe of the ear strongly downward with the fingers of the hand which is holding and directing the speculum. This procedure draws the lower wall away from the upper and affords sufficient space to allow a clear view of the drum, though it is seen even then at a considerable angle and cannot be looked at vertically; though by tilting the head of the patient away from the observer a more nearly vertical view is obtained.

Diagnosis of Mastoiditis of Infants.—It is proper to assume that some degree of inflammation of the antrum exists with all severe infections of the attic. On examining the ear the posterior superior quadrant of the drum membrane is found red and bulging; or if it has spontaneously ruptured, it presents the typical teat-like swelling indicative of inflammation and edema of the mucous membrane of the attic. At this stage, before any external swelling is present, it is often difficult to determine the proper course of procedure, since mastoid inflammation with intracranial symptoms often develop no external swelling. At this time the appearance of the tympanic membrane and the severity of the ear symptoms must be the chief guides.

Recourse to bacteriological examination of the discharge is frequently of value in determining the indication for or against an operation. In the routine examination of cases in the New York Eye and Ear Infirmary it has been demonstrated that the virulence of the infection varied with the organism. In spite of preventive treatment, almost all cases of mastoid inflammation due to the streptococcus came to operation; those in which the pneumococcus was found required operation in one-half the cases; in those due to the staphylococcus the mastoid operation was rarely required.

Tenderness about the ear, especially over the antrum, is significant, if present, but the presence of a point of tenderness is often difficult to elicit in infancy.

A rapidly changing temperature, reaching at times a high point, rarely in childhood beginning with a chill or a convulsion, is significant of involvement of the lateral sinus or jugular bulb. On the other hand, phlebitis of the jugular has been observed to be quickly followed by pneumonia, which complicates the situation and masks the typical course of the original disease.

Necrosis of the mastoid bone in the direction of the sinus may lead to an invasion of this structure with the gradual formation of an infective clot. The dura covering the sinus resists these inroads for a time with apparent success, for it is quite a common experience to find at this point the surface of the sinus the site of an abscess, while the vessel beneath is uninjured. In infants an infection of the sinus is marked by restlessness and a marked rise of temperature. In adults the invasion is ushered in by a chill.

Abscesses of the cerebellum are not a rare result of inflammation extending from an infected clot in the lateral sinus.

Complications.—The two points through which infection is most likely to extend from mastoid antrum abscesses to the cranial contents are the tegmen tympani and the wall of the lateral sinus. The thickness of the bone is least in these directions, and consequently least resistance to inflammatory action is here met with.

In infants perhaps the most common intracranial complication is meningitis; either lepto-meningitis or tubercular meningitis. Autopsies occasionally disclose the track of both

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Facial Paralysis is one of the uncommon complications of mastoiditis in young children in the experience of the writer. A case occurring in a child of six months of age with tubercular mastoiditis has come to my attention. In this case at the first examination of the patient the incus of the affected side was found unattached in the external auditory canal. The removal of this obstruction furnished free vent to the inflammatory discharges; but the other side shortly developed in rapid sequence suppurative otitis media, subperiosteal mastoid abscess and meningitis.

The lepto-meningitis of otitic origin differs in no respect from that due to traumatism or other sources except in such symptoms as are occasioned by the previously existing disease.

In localized ulceration of the brain, in epidural and subdural abscesses, more or less localized or general meningitis is present; so that the differentiating symptoms may be difficult to recognize. The predominance of lepto-meningitis occasions high fever, photophobia, cephalalgia, rapid pulse and respiration, retraction of the head from contraction of the muscles of the spine, delirium and stupor. When the collection of pus is localized (brain-abscess) and sufficient to occasion pres-

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Active treatment consisting of operative interference should not be delayed too long, especially when restlessness and pain continue. A discharge, however insignificant, is a symptom not to be disregarded in infants when recurring attacks of pain point unmistakably to the presence of active inflammation in a region where the escape of inflammatory products is fraught with so many unpleasant possibilities.

Operation.—In operating for simple mastoiditis of infants it is proper to make the object point, first of all, the mastoid antrum. Some cases, it is true, recover with simple incision of a sub-periosteal abscess. But the percentage of thorough recoveries must be few, relapses many, and the establishment of chronically discharging bony sinuses are common results of this unscientific treatment. In most cases a suppurative process is present in the antrum from which a continuing rarefying osteitis may extend in any direction with a possibility of the cranial contents becoming ultimately involved. The mastoid antrum should be entered in *every* case in which an operation is performed. Having once entered the mastoid antrum, free drainage may be thoroughly removed, necrotic material may be thoroughly removed, and one has the satisfaction of thoroughly understanding the state of his patient. Chronic suppuration of the middle ear is otherwise about the least harmful condition which is likely to result from a mastoiditis which is not thoroughly operated upon.

these forms of meningitis to have occurred by way of the middle ear, and the writer cannot too strongly emphasize the need of strict attention to the ears of infants affected with acute otitis, especially during the course of acute contagious disease.

Tubercular Meningitis.—Cases of tubercular otitis subsequently involving the mastoid antrum and terminating in meningitis are not rare. The writer has seen several typical cases. The course to a fatal termination is favored by the less dense structure of the bone in infancy. The inroads made by the disease in the children living in poor and unsanitary quarters, before the parents regard them as really ill, are almost incredible. The disease may, however, progress without apparently very pronounced symptoms. Discharges from the ear, which, it seems, often drive the parents of the poor to the hospitals and clinics because of the foul odor, in tubercular otitis are often almost odorless. Apparently in this class of patients the discharge is often entirely overlooked since it is a common experience to find that they are ignorant of it when the child is presented at the clinic.

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Treatment.—Preventive treatment of mastoiditis in children consists in free and frequent syringing of the ear when a discharge exists in an acutely inflamed ear; and in freely incising the drum, behind which, on examination, pus is observed to be exerting pressure in those cases in which no discharge exists. Pouting perforations of the upper and posterior portion of the drum, which may be regarded as often on the border line of mastoid inflammation, may likewise be incised with benefit when it is found that the perforation is insufficient to carry off the inflammatory products.

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SOCIETY PROCEEDINGS

PHILADELPHIA PEDIATRIC SOCIETY

Regular Stated Meeting, April, 1904.

TUBERCULOUS MENINGITIS—Drs. S. McC. Hamill and William G. Spiller presented a patient, aged two years, having tuberculous meningitis, tuberculous disease of the left ankle and a gonococcal vulvo-vaginitis. The child was perfectly well until July, 1903, at which time she had an attack of measles, which was followed by a severe pulmonary condition, which was thought to have been bronchitis. This pulmonary condition has persisted to the present time, although the child has gained in flesh and is now unusually fat. Prior to two months ago she was vomiting frequently. For some weeks she has been having four or five loose, bright-yellowish, mucus-containing bowel movements daily. In October, 1903, the child developed a paresis of the entire left side. The loss of power in the arm and leg was thought to have developed before the paralysis of the face, which came on gradually and involved the entire distribution of the nerve. Shortly after the facial paralysis left internal strabismus developed, coming on suddenly during the night. In January, 1904, the left ankle began to enlarge and grow painful. Preceding this she had marked cramps in the left leg. At present she is irritable, takes no interest in her playthings, and occasionally, while sitting in her mother's lap or on the floor, she will cry out that she is falling downstairs. She has never fallen. She has no headache and has had no convulsive seizures. Five or six weeks ago, while in the Rhode Island General Hospital, she developed a gonoccoccal vulvo-vaginitis. She runs a persistent mild temperature—from 99 degrees to 100 degrees F. The physical examination showed the left external rectus was paretic and the right external rectus also was weak, although not to the same degree. All the muscles in the innervation of the left facial nerve were paralyzed, so that the child could not close the left eye or draw up the left corner of the mouth. The left upper and lower limbs were weak, but they could be moved voluntarily. Sensation was not affected. The patellar reflex was diminished on each side. There was an area of consolidation at the base in the right lung close to the vertebral column. An examination of the eyes by Dr. Hansell showed both optic nerves atrophied, and the blood vessels of both eyes greatly lessened in calibre, but there were no nodules to be seen in the eye-grounds. The persistence of the pulmonary symptoms, more especially the pulmonary signs, the occurrence of the joint affection, its gradual development and persistence, the peculiar character of the swelling involving the back of the joint and obliterating the post-malleolar hollows, and the extending around and below each malleolus, producing a pyriform swelling, the marked irritability and gradually developing meningeal signs, led to the inference that the pulmonary, joint and meningeal manifestations were all tuberculous in origin. The possibility of gonococcal infection was suggested, but it was clearly demonstrated that the vulvo-vaginitis had developed sometime after the presence of the other symptoms. The point of interest in the treatment was the rapid disappearance (within ten days) of the vulvo-vaginitis under the use of douches of boric acid solution (10 per cent.), followed by the introduction of one ounce of 5 per cent. solution of argyrol, which was retained in place by means of a pad.

Dr. Jopson asked Dr. Spiller whether the cerebral condition could not be a tuberculous tumor. This diagnosis had suggested itself to Dr. Jopson on account of the comparative frequency of these growths in childhood; because the disease of the ankle joint is, in all probability, tuberculous; on account of the presence of paralytic symptoms, and because of the slow progress of the case.

Dr. Spiller replied that he thought that the symptoms could not be explained by the existence of a tubercular tumor. He had considered this possibility, and had reached the conclusion that if it is a tumor at all it is a tumor of the pons. If a tumor of the pons were present, the facial paralysis would probably be on one side, and the palsy of the lines on the other; while in this case the contrary is true. Furthermore, the facial palsy is of peripheral character, all branches of the facial nerve being involved. It is, therefore, apparently a separate condition from the palsy of the extremities, and it developed some time after the limbs had become paretic.

Associated Movements—Head and Eyes.—Drs. S. McC. Hamill and W. C. Posey presented three cases illustrating associated movements of the head and eyes. All of the children were colored and markedly rachitic.

Case I.—Aged three years, showed a lateral nystagmus of equal excursion in both eyes with a rotary spasm of the head, during which the head was turned to the right and the chin elevated, indicating action of the left sterno-cleido-mastoid muscle. This child showed some limitation in the excursions of the extraocular muscles, a mild ataxia and some defect of vision. The ataxia and defective vision were thought to have been confusional in origin. The condition developed in this patient at the age of three years, which is unusually late, the majority of cases occurring between the second and twelfth months of life.

In *Case II.* the movements began between the third and fourth months, involving both the head and eyes. They were equal on both sides. This child had intermittent spasmodic contractions of the muscles of the back of the neck.

In *Case III.* there were no head movements noted at the present time, and according to the mother's statement, none had ever existed. The nystagmus was mainly in the right eye, and was supposed to have existed since the third month of life. In this case vertical vibratory movements of the upper eyelid were produced once or twice on an attempt at sudden fixation. Strabismus was not noted in any of the cases. The pupils were normal in size and reacted normally in all cases, and there were no changes in the fundi other than a moderate dilatation of the retinal veins noted in Case I. The eyes in all three cases were moderately hypermetropic.

The underlying factor in the production of all these cases was thought to have been rickets. The theory of Haddin as to the nature of these movements is that accepted by the authors.

Dr. D. J. Milton Miller considered it very significant in the etiology of the condition that almost all the cases shown before the society had been in negro children. In his experience, also, most of the cases have been in negroes. These facts point toward the great importance of rickets in producing the condition. Dr. Miller had noted that one of these cases followed a rather severe bronchitis, and asked whether any depressing illnesses had preceded the condition in the other cases. Preceding disease is very common; measles, in particular, seems to have a certain tendency to be followed by the condition in children predisposed to it. Raudnitz has attributed the affection wholly to eye-strains; but, in an investigation made some years ago, Dr. Miller found that this was present in only a small proportion of the cases. All authorities agree as to the functional nature of the affection, and incline to attribute it to explanation of the centers presiding over the muscles of the eye or of the head; which is as much as to say that we are ignorant as to its nature.

Dr. Hamill, in reply, said that there was no apparent relation with any immediately preceding disease in two of the cases.

Rickets of Chest.—Dr. Ralph Pemberton showed a case presenting an unusual deformity of the chest, apparently the result of rickets, that occurred in a colored child two years of age. This child had marked signs of rickets, and, when admitted, had general tenderness and discolored, sore gums, suggestive of scurvy. The deformity was a curious knuckling of three ribs (the sixth, seventh and eighth) on the left and above the costochondral junction. It had formed a bony projection about the size of a walnut, resembling a fracture with redundant callus. The condition was absent on the other side. It appeared to give the child no inconvenience.

Dr. J. P. Crozer Griffith said that he had been impressed with the way in which the condition simulated fracture, but he considered it to be merely rickets. As an instance of the remarkable deformities that may be produced by rickets, he mentioned a case in which, while the child was under observation in the hospital, a truly remarkable hollowing of the chest upon one side occurred, owing to the child's habit of lying upon this side.

Dr. Miller referred to the interesting frequency of rickets in negroes and Italians in this climate; while, according to statements of many Southern physicians, it is relatively uncommon among the negroes in the South. Along the coast of Maine, also, where the children are fed in a most unhygienic manner, whether from breast or from bottle, rickets is uncommon. Such facts indicate, to Dr. Miller's mind, that there is a climatic element in the production of rickets. Possibly the fact that races like the negroes and Italians, whose ancestors, for generation upon generation, have lived more or less in the open air, are very susceptible to the confined life of cities, may explain this. A few generations of city life will make this susceptibility less.

ALVEOLAR ABSCESS AND HYDROCEPHALUS.—Dr. S. H. Cross reported a case of alveolar abscess followed by acute hydrocephalus, in a child ten weeks old. The baby had been well until he was six or seven weeks old, when he became fretful, lost weight and cried when lifted. He was seen for swelling of the right side of the face, associated with fever and marked gastrointestinal disturbance. He was poorly nourished. The swelling of the right side of the face was most marked over the superior maxilla and about the eye, which was entirely closed. There was a slight dark-blue discoloration on the cheek. The gum over the right half of the upper jaw was swollen, soft and tender, and showed a dark discoloration, which extended over the hard palate as far as the median line. The throat was negative, and there was no nasal discharge. There was no pain on moving the extremities, but the child experienced pain on being lifted. The blood-count showed hemoglobin, 55 per cent.; red corpuscles, 3,380,000; and leukocytes, 12,000. Five days after this pus was discharged from two openings on the alveolar margin, and from one opening at the junction of the alveolar and the buccal mucous membrane. An analysis of the mother's milk revealed about normal conditions; but, owing to the continued severe gastrointestinal derangement, the baby was put on a milk-mixture. After the escape of the pus the child's temperature became normal, and there was general improvement. The swelling disappeared, but the discharge of pus continued until three weeks later, when a very small piece of bone was discharged. After this the opening closed. Soon afterwards there was swelling of the lower right eyelid, with tenderness, redness and fluctuation, and a small incision evacuated about half a dram of pus. Subsequently, a small amount of pus was continuously discharged from this opening.

After this some improvement took place, and continued for three weeks, at the end of which time the child suddenly became worse. The veins over the scalp, especially on the right side, became prominent, and he vomited after every feeding and was restless and feverish. An acute hydrocephalus developed, the circumference of the head increasing to nineteen inches. Examination of the eyes, at this time, by Dr. Posey, showed engorgement and tortuosity of the retinal veins, but no other abnormality. The mother's eyes, also, showed evidences of a previous extensive choroiditis. The child was put on inunctions of mercury, and the size of the head decreased rapidly, but he was unable to retain nourishment, and emaciated continuously. Clonic convulsions developed and involved the whole body, and there was a tendency to opisthotonos. The child died two days later, and an autopsy was not permitted.

Dr. Posey said that he had seen the child two weeks after the head swelling had begun. At that time he had observed marked tortuosity of the retinal vessels. The case was a very interesting one on account of the occurrence of a maxillary abscess followed by swelling of the head. The latter subsided under the use of mercury. These facts, in connection with the fact that he had previously seen the mother and had found in her choroids extreme changes that he thought to have been caused by syphilis, led Dr. Posey to believe the condition to be syphilitic.

Dr. J. A. Scott thought that there is too much tendency to call all conditions that respond favorably to the use of mercury syphilitic. In his opinion, Dr. Cross's case might well have been one of streptococcic infection. He mentioned a case recently seen by him in which the symptoms had begun in much the same way. The child first presented swelling of the jaw, and afterwards there occurred temporary swellings in various parts of the face. These a dermatologist considered to be erythema fugax, an extremely rare condition. The child died after about two weeks, owing to severe digestive disturbance. The post-mortem examination showed absolutely no evidence of syphilis, but beneath the scalp there was a small collection of pus, which during life had appeared to be edema. There was also a general streptococcic infection.

Dr. Cross, in reply, said that it had been impossible to make a definite determination of the etiology in his case, but that he was inclined to believe that it may have been a general bacterial infection, similar to that in Dr. Scott's case. It had been considered a manifestation of hereditary syphilis on account of the absence of fever, the extensive choroidal changes in the mother's eyes and the rapid decrease in the hydrocephalus under the use of mercurial inunctions.

ARTERIO SCLEROSIS IN CHILDREN.—Dr. Theodore Le Boutillier reported a case of thickening and tortuosity of the arteries in a child of two years. The family history was negative. The child had had pneumonia, followed by cervical abscess and post-pharyngeal abscess. When seen the lungs were normal, the heart was not enlarged, and there was no murmurs, but the aortic second sound was much accentuated and all the arteries—especially the carotids, the temporals and the radials—were hard and tortuous. The child died, and an autopsy could not be obtained.

EMPYEMA.—Dr. John H. Gibbon reported two cases of empyema. One occurred in an infant of twelve months, which was seen four weeks after the beginning of the attack. The latter had followed a very severe pneumonia. When seen the child had an extensive empyema, her condition being so bad that it was considered unwise to remove the fluid rapidly. Hence, five or six ounces of pus were withdrawn with an aspirating needle, and without using an anesthetic, an incision between the ribs was made and drainage was introduced, the dressing having been applied before the chest had been allowed to empty itself entirely. There was free discharge afterward, and the child immediately improved, and a few days later it developed a pneumonia of the other side, of which it nearly died. Ultimately the patient recovered completely, both lungs performing their functions in a satisfactory manner. When first seen the infant had a palsy of the left hand and foot, but this also passed away. Dr. Gibbon had not previously operated for empyema upon so young a child.

The second case occurred in a boy of seven years, seen in the Polyclinic Hospital. He had had imperfect drainage of the left chest for empyema some weeks previously. When first seen by Dr. Gibbon he also had empyema of the right chest and a pyemic abscess of the right shoulder. The two plural cavities and the abscess were necessarily drained at once, a small amount of anesthetic being used, and resection of the ribs being rapidly performed. The time consumed in operating was only eleven minutes, and Dr. Gibbon considers that in such cases it is very important to operate with great rapidity. The patient did well until several weeks later, when, while at home, he died very suddenly, the doctor in charge having just changed the dressings. This case is of interest on account of the occurrence of sudden death, in spite of the fact that irrigation of the pleural cavity had not been carried out.

Dr. Miller said that in his last service at the Children's Hospital he had had fourteen cases of croupous pneumonia in children under two years of age. Among these there had occurred two cases of empyema; one in a child of eighteen months, and the other in a baby ten months old. Dr. Miller believes empyema to be more common in infants than is usually supposed. Unfortunately, it is very likely to be overlooked, as there are but two reliable signs: marked flatness, with resistance upon percussion, and the results of exploratory puncture.

Dr. J. H. McKee mentioned a case of empyema in an infant that was three months old when seen, and had been operated upon two weeks previously to this. A drainage tube had been inserted between the ribs. Owing to the narrowness of the interspaces in so young child, some difficulty in inserting the drainage tube without resecting a rib had been expected. At Dr. G. G. Davis's suggestion the costal cartilages, which are extremely soft at that age, had been pushed aside with hemostatic forceps. The drainage through the tube had been good, but the infant died.

Dr. Griffith thought that empyema in young children is not uncommon. He did not know the exact figures at the Children's Hospital, but was inclined to believe that there had been more cases than Dr. Gibbon had suggested. At any rate, it is a fact that when infants get pleural effusions these are very likely to be purulent. He mentioned one case that he had seen in an infant of eight months, in which pneumothorax, as well as pyothorax, had developed. He had also seen a child of three months whose case was similar to that of the infant mentioned by Dr. McKee, and believed that it must have been the same child. Dr. Griffith had seen it before it was operated upon. This was the youngest patient with empyema ever seen by him.

Dr. W. C. Elmer, in connection with the danger of sudden death from the rapid withdrawal of a large amount of fluid in extreme cases of empyema with the utmost degree of cardiac displacement, mentioned a case in a child of three years, in which there was such a large effusion that he was afraid to attempt to withdraw the fluid rapidly. Hence, he adopted the plan of aspirating the chest on each of several successive days, withdrawing in three days three pints and a half of pus. This so relieved the child that he felt it to be safe to introduce a trocar and canula, passing a small rubber drainage tube through the canula, well down into the pleural cavity. He then withdrew the canula, leaving the drainage tube in place, and so permitting continuous drainage for one week. After this he established more formal drainage under chloroform anesthesia. This child recovered completely. During its convalescence it was induced to blow soap bubbles several times daily, as a satisfactory substitute tor the use of Wolff bottles to inflate the lung;for it was too young to be taught the use of the better method.

Dr. Jopson said that in looking over the reports of the Children's Hospital he had found that of fifty cases of empyema, four or five were in infants less than one year old. He believes that there is no real difficulty in introducing drainage in young children without resecting a rib. The real trouble is caused by the presence of masses of lymph ,which tend to obstruct the tube. He said that Dr. Gibbon's case of double empyema had furnished an example of the method of treating such cases. One side should be drained first, and then the other, in order to avoid emptying the fluid from the chest too suddenly.

Dr. Gibbon said that in his opinion a good procedure, in order to avoid the necessity of resecting a rib in such cases, is to bite out, with a Rongeur forceps, a semi-circular piece from the upper edge of the rib, and allow the tube to lie in this space. This prevents compression of the tube and a blocking of the flow, which is one of the chief difficulties when the space between the ribs is very narrow.

Rupture of Abdominal Viscera.—Dr. Gibbon also reported two cases of rupture of abdominal viscera. The first of these was a rupture of the spleen that occurred in a boy, and was due to a fall from a tree. After this fall there was immediate shock, but the patient recovered and went home. The next day he was much shocked and exceedingly ill. The day following he was seen by Dr. Gibbon. He then had all the symptoms of severe abdominal hemorrhage with free blood in the abdominal cavity. It was impossible to determine the source of this hemorrhage; hence, the liver was considered the most likely seat, and an incision was made over this organ. Free blood escaped from the wound; but as the liver and the other organs on the right side were found uninjured, the opening was closed. An incision was then made on the left side, and a laceration of the spleen was discovered. This was firmly packed with gauze and the abdominal cavity was irrigated. After the wound on the right side had been closed it was found that the hemorrhage had been controlled by the packing. The latter, therefore, was left in position, and the wound was partly closed. The boy made an uneventful recovery except for a slight left-sided pleurisy. The other case was one of rupture of the liver, and occurred in a girl nine years of age, who had been run over by a wagon. When seen, two hours after the accident, her condition was exceedingly bad. She had shown progressive shock, and there was abdominal rigidity and tenderness. Intra-abdominal hemorrhage was thought to be present; and, in the absence of other indications of its seat, an incision was made over the point of tenderness (i. e., below the umbilicus, in the median line). Blood was evacuated through this wound, some clots coming from the right side. The liver was then explored, and a large laceration was found. An incision through the right border of the upper portion of the rectus showed the wound to be situated about three-quarters of an inch external to the gall bladder. It was about three inches in length, and extended through the entire thickness of the liver. It was packed with iodoform-gauze. The pelvic cavity was then irrigated, a large quantity of blood and clots being evacuated. The laceration of the liver was then found to be still oozing. In attempting to control this condition a clot was probably loosened, and for a few moments there was exceedingly profuse hemorrhage. This was ultimately controlled by repacking the wound, and by placing large pads beneath the liver and between that organ and the chest wall. During the operation seven pints of salt-solution was injected intravenously. The child improved somewhat, but died on the third day after the operation, apparently on account of the loss of blood. In commenting upon these cases, Dr. Gibbon spoke of the treatment of abdominal contusions, and of the difficulty, in the presence of shock and of other severe symptoms, that one finds in determining whether there is any laceration of a viscus. The case of rupture of the spleen illustrates the fact that marked symptoms may be absent for many hours after a severe laceration of one of the abdominal organs. Definite rules cannot be formulated in such cases; but Dr. Gibbon thinks that when there is any evidence of intra-abdominal bleeding operation should be carried out at once. Persistent rigidity and localized pain also indicate exploration. He referred to cases in which there is profound shock without serious lesion, and stated that they usually improve rapidly, and may be well before the necessary preparations for operation can be made. Progressive shock he considers to be the strongest of all indications for operation.

HEMORRHAGE IN BRAIN.—Dr. Spiller demonstrated the brain of a new-born infant, showing extensive hemorrhage into both hemispheres. The clinical notes had been obtained by Dr. Hamill. The child had a temperature of 99 to 100 degrees F. during the first three days after its birth. On the fourth day its temperature rose to 104 degrees. It was slightly jaundiced and had some diarrhea. A papular eruption on the face and trunk was observed on the eighth day, and the epidermis of the feet and the hands desquamated. On the eleventh day the child began to show a tendency to retract its head and turn it to the left, and the muscles of the neck became somewhat rigid; it also had one convulsion, which at first was tonic, but later became clonic, the convulsion involving all the limbs. During the next twenty-four hours four convulsions occurred, and it died on the thirteenth day. Dr. Hamill removed the brain, and found a large hemorrhage into the left hemisphere (three or four ounces of coagulated blood), and a smaller amount of blood in the right hemisphere. After having shown the specimens Dr. Spiller discussed the causes of hemorrhage into the brain (traumatic origin) in young children, and spoke of a few clinical and pathological cases.

Dr. Hamill said that the reason he had asked Dr. Spiller if he did not consider that the condition might be dependent upon an infectious process was that the infant had had fever; a rash, which was at first papular and then hemorrhagic, and disturbance of the bowels, with greenish mucous stools—symptoms which are rather characteristic of the infections of the new-born. Dr. Hamill had taken cultures from various organs in this case at the post-mortem. These had shown a bacillus, probably of the colon group, distributed everywhere. The exact nature of this bacillus had not yet been determined.

GLIOMA OF BRAIN.—Dr. John H. Jopson and Dr. D. J. McCarthy reported a case of glioma of the brain in a boy of four years. The symptoms were of seven weeks' duration, and began with drowsiness, quickly followed by left-sided hemiplegia, headache, restlessness and night cries; vomiting and partial incontinence of urine were also present. There was a partial return of power in the leg after two weeks, and consciousness and speech were preserved until shortly before death. Fever and convulsions were absent. The pulse was 55 on the day of admission to the hospital. A few hours later he became unconscious; the pulse became rapid and weak, the temperature rose, and the sypmtoms of fatal paralytic compression of the brain were present. The patient was trephined the same night, in the hope that a hemorrhage or a collection of fluid might be evacuated, as there was a history of a fall preceding his illness, but nothing was discovered, and he died shortly afterward. At autopsy a gelatinous tumor, with areas of hemorrhagic extravasation, was found to occupy the anterior two-thirds of the right hemisphere. It began immediately beneath the ependyma of the third ventricle, and extended to the external capsule. The anterior third of the internal capsule was infiltrated by the tumor-mass. At no point did the tumor reach within an inch of the cortical surface. Microscopic examination showed a neuroglioma, composed entirely of neurogliar nuclei and fibers. The tumor was of central origin, of an infiltrating character, and inoperable.

EDITORIAL

THE PROBLEM OF MILK PRESERVATION

Not many months have passed since Behring started a discussion concerning the living qualities in milk that has served as a lever to uproot many settled notions concerning the milk problem and has introduced into medical literature a host of new questions which have been studied with no end of controversy.

We are all aware of the ingenious theory that Behring propounded: that in the milk of the human animal, in cows, and even of other animals there were present antibacterial, antitoxic, and other protecting bodies which, speaking particularly of the problem of tuberculosis, might be utilized in the struggle against this one infecting micro-organism. It is pretty widely known how he proposed to hyperimmunize young cows and thus increase the amount of these antibodies in the milk and thus eliminate entirely the scourge of infant tuberculosis which he thought was largely a matter of infection from bovine sources.

The cautious scientist has not accepted Behring's views without reserve. Bearing in mind the proven to be untrue dictum of Koch concerning the non-infectiousness of bovine tuberculosis, many have taken a middle ground, and while recognizing the digestive tract as a possible route of infection they have devoted their energies to the study of the more direct and urgent features in tuberculous infection.

But apart from the subject of tuberculosis and milk, the phase of the subject that regards milk in the light of a living fluid, and that interference with its physical, chemical, and zymotic characters is bound to be reflected in conditions of disturbed nutrition, this side of the problem is worthy of special attention.

Flügge, it may be remembered, contended, in opposition to Behring, that there were no antibodies in milk, but even if these be eliminated from the discussion, the question remains, does a modification of the milk brought about by boiling, by pasteurization, or by antiseptics, so alter its character as to render it a different fluid, and if so, to what exent?

It is surprising to read the researches that have been undertaken and which have arrived at contradictory conclusions. The dictum that boiled milk is a cause of infantile atrophy and Barlow's disease represents the conclusions of one series of investigators, notably Huebner and Barlow himself; while such excellent observers as Budin, d'Espine and Variot, in careful series of experiments, maintained that such was not the case. Scorbutus has been the scare line for others who would have no boiled milk (Fruitnight, Netter), while many other equally competent men pronounce such views chimerical. All of which serves to accentuate the view that as yet we are not in a position to make positive statements regarding the action of boiling on the vital principles resident in milk. Naturally the grosser features of sterilization, etc., are not under discussion in this place.

The most interesting feature of the discussion at the present time resolves itself about the use of an antiseptic in milk that will least interfere with the hypothetical antibodies of Behring and will serve the great function of keeping the milk sterile and not interfere with the digestive organs or with the physico-chemical properties of the food products. Behring maintained that formaldehyde was just such a body. Its structural simplicity; its being a constant product in all constructive metabolism in plants, and its pronounced antiseptic action, which it undoubtedly has and exercises in living metabolic activities, all lent a certain air of plausibility to the argument and stimulated another great series of researches, with customary contradictory conclusions.

It is certain we believe that the action of the Consulting Committee of the Hygienists of France whereby they condemned the use of formaldehyde as a milk preservative, will have the sanction of the major body of hygienists who have taken up this question, but it is by no means to be assumed that the discussion has been settled.[1]

At all events we are much nearer the solution of the problem of milk preservation - negatively, if not positively—to-day than we were two years ago when Behring promulgated his very attractive "antibodies" as important factors in the milk problem.

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[1] Consult H. de Rothchild and L. Netter, L'emploi de l'aldehyde formique come agent de conservation du lait. Revue d'hygiene et de méd. infantiles, Vol. 3, No. 2, 1904.

SUBSTITUTION AND INFANT MEDICATION

The trend of much modern physiological and pharmacological research would seem to show the immense importance of minute chemical alterations in the plasma of the body fluids. Infinitesimal traces of dissociated potassium salts exert a profound influence on mucular contraction, and imperceptible amounts of other ions have marked effects on the vital biological processes of metabolism.

We do not enter into the details in this place. Those who have read the recent work of Van t'Hoff, Mann, Ostwald, Jones, Loeb and many others are aware of the growing impression that many of the fundamental secrets of biological phenomena are being revealed by the physicochemical key, and this same mode of attack is offering fruitful results in the domain of the remedial arts, pharmacology, which is the hand maiden of therapeutics.

While much has been written concerning the evils of drug substitution, these have been so lividly painted that we feel that the mark has been overshot, and that there remains in the minds of the practitioners at large either those ideas that are reflected in the attitude of the one who says there's "nothing in it"—"but a squabble between rival drug houses;" or of the other who is much overwrought and believes that "some one ought to hang."

The medium ground recognizes that substitution is a great evil. Of this there is no doubt. Commercially the extent of the practice is beyond any mode of computation. Medically, much of this sophistication is a negligable quantity.

But of a certain part, and particularly in certain types, and of certain drugs, we believe that a keen discrimination must be shown. A judgment founded, not on the attitudes already characterized as those commonly held, but a discrimination founded on a more fundamental conception of drug constituents and drug actions.

At the present time we can only speak of certain affections in childhood, in which we believe this evil of not getting exactly what the physician orders, is of paramount importance. We refer more particularly to the acute toxemias of the infectious diseases, during which the heart muscle suffers, often irreparably.

In these affections it is by no means an isolated practice, but we believe from observation and from extensive reading that the antipyretics of the aniline, or coal-tar series, are extensively prescribed, and it is in this one class of drugs, which are of comparatively recent manufacture, that so much substitution is being practiced.

We do not now refer to the so-called impure phenetidines, or the 1-2 per cent. below Pharmacopœial strength of certain preparations, but to the gross sophistications which in certain localities are made by enterprising and unscrupulous drug vendors, or more rarely by the pharmacists themselves. It is largely to be regretted that pharmacy has fallen from its one-time high estate to occupy the place of the department store, dealing with almost everything to heal or destroy; but the social phase of the competitive struggle, while offering a delightful and knotty problem, is apart from our central idea.

How, with a vitiated pharmacist esprit; with physicians who have aided in their destruction by their liberal patronage of the "tablet industry" army, and have themselves deteriorated in pharmacological lore to the formless knowledge that F's 67, or K's R. J. Q. and X. is a splendid thing for diarrhea or bronchitis; with drug vendors who will do anything to make an extra cent on a pound; how, with all of these and many more elements, the thinking, non-penny-in-a-slot-physician will be able to guide his little toxic patient when the most trivial alterations from known standards of drug purity can turn the balance away from recovery, is a problem which demands better pharmalogical training, more fundamental chemical knowledge, and a vigorous and united stand against the parasites of the legitimate and honorable drug industries.

ABSTRACTS

The Ultimate Results of Tendon Transference in Infantile Paralysis.—DEROCQUE (IV. Congres Periodique de Gynecologie, d'obstetrique, et de Pediatrie) makes an extended report upon the subject. The author has corresponded with a large number of general surgeons and orthopedists, and their communications together with available published work on the subject form the basis of the report. Nicoladoni performed the first recorded operation in 1881 and since that time Mauclaire, Goldthwait, Golding Bird and many others have performed various operations of like character for the relief of infantile paralysis. The questions sent out sought to ascertain the kind of operation performed, whether transference, pure and simple, or with tenotomy or arthrodesis, and the results at six and nine months after operation. In all, about 500 cases were collected, although many of these were not previously published, but were taken from private and hospital records.

Many of the cases are published in considerable detail, while in many communications received, important details are wanting. Some of those who sent communications considered the operation on the whole, of doubtful value, while others speak highly of it in certain cases. The author concludes his paper as follows: he refers to the fact that the mortality, which is practically nil, as only one fatal result is recorded; that in many cases, where scrupulous care was taken, a tendon transference in infantile paralysis has resulted in a limb not only useful, but nearly normal; that again, where equally scrupulous care was used, the operation has proved a failure; that further, in many instances, only a partial amelioration occurred, necessitating an additional operation; that to determine the proportion of excellent results, of mediocre ones, and of failures is very difficult, since some surgeons who have performed a great number of operations remain faithful to their original methods, while others with equal experience, are seeking to combine transference with some other procedure, such as arthrodesis; that finally, in view of the fact that so many important details are wanting in many of the communications, judgment is best reserved until many more cases are reported with details, since then and then only can a definite value be placed upon tendon transference as an operative procedure in infantile paralysis.

Temperature of the Newly-born.—PEMBREY, M. S. (British Medical Journal, No. 2,252, Feb. 27, 1904). The writer in a general summary of bodily temperature gives some valuable data on heat production in the newly-born. The temperature of pups, kittens, and rabbits falls rapidly after they are born until it reaches a point only a few degrees above the temperature of the air. Newly-born guinea pigs are able to maintain their temperature if the cold is not excessive. Young warm-blooded animals can be divided into two classes—those which at birth are blind, helpless, and in some cases naked, and unable to regulate their temperature, and those which are born better developed and capable of maintaining their temperature at a fairly constant level.

The practical interest of these observations on animals relates to their applicability to the human infant. Raudnitz has studied the temperature of children immediately after birth. Cold affusions at this time will cause a rise of rectal temperature in strong infants, but the body heat remained stationary or fell in those who were weakly. Heat radiation was only a secondary cause of the radiation of bodily temperature; the chief cause was the imperfect power of regulating the body heat.

Lobar Pneumonia in Children.—Abrahams, B. (British Journal of Children's Diseases, Vol. 1, 1904, April). Among the diseases of frequent occurrence in children which are often overlooked is lobar pneumonia. It is a common affection from the age of two and upward. As this disease occurs in children it differs somewhat from its appearance in adults. The seasonal incidence of lobar pneumonia in children reaches its maximum in the spring, but does not show so definite and well marked a curve as is found with adults. The malady attacks chiefly those who are debilitated. The onset is usually sudden, and in common with all maladies which begin abruptly, the symptoms are usually nervous or gastrointestinal. A child coming down with lobar pneumonia may have convulsions with or without vomiting and diarrhea. In such a case the only other symptoms will be a high fever and a dry, burning skin. At this stage the physical signs in the lungs have not developed. The first thought of the practitioner is that the patient has scarlet fever, and it is not until after the characteristic rash and sore throat have been excluded by time that the diagnosis is made. Another disease which may be closely simulated at the onset is meningitis. Lobar pneumonia in children is frequently apical, and these cases are often ushered in by head symptoms. A point in the diagnosis of apical pneumonia is that the temperature is as a rule high, reaching frequently 105 degrees, and this distinguishes it from the usual forms of meningitis, in which the temperature does not run so high. The lobar type is not always strictly adhered to. Freusually a patch of consolidation is found in one or the other apex, and there will be dulness over the whole back of the chest on one side. The dulness is not as a rule extreme, the note having usually a ringing, tubular character. In [illegible] of the writer's [illegible] cases the apices were attacked. [illegible] tubular breathing can always be heard, together with high-pitched râles. The very loud râles so characteristic of [illegible] pneumonia are not heard in this [illegible] and the [illegible] [illegible] [illegible]

[illegible]

[illegible]

advantage over castor oil and cascara sagrada. Its action is slow; and here his experience differs from that of Ebstein, for he found that it takes on an average 18 to 24 hours to manifest its effect. Action in 8 to 12 hours only occurred in mild cases of chronic constipation or when repeated doses had been given. This slowness of action proves that the drug, in contradistinction to the rapidly-acting purgatives, has no injurious or irritant effect on the intestinal mucosa. Exodin does not occasion a sudden and temporary downward peristalsis of the intestinal coils; it has a slower and more protracted stimulant action. This explains the facts that gastric pains and colic are absent; that the evacuations with rare exceptions are soft and formed, and diarrhea is hardly ever seen; and that its action, which lasts several days and only gradually subsides, is not followed by constipation.

The Surgical Treatment of Epilepsy.—J. CHALMERS DA COSTA, of Philadelphia Medicine, Professor of Principles of Surgery and of Clinical Surgery in Jefferson Medical College, says in determining upon the course of treatment suitable for a person suffering with epilepsy, due consideration should be given to the possibility of effecting cure by or of obtaining benefit from a surgical operation. A correct decision cannot be reached intuitively. A conclusion must not be jumped at. Aphorisms, dogmas, or formulas will not aid us. An opinion, to be of value, must emanate from some one who possesses a scientific knowledge of epilepsy and has examined the patient with painstaking care; who has secured an accurate history of the sufferer's previous life, of his diseases and accidents, of his hereditary tendencies, and of the exact character of his convulsive seizures. If care of this nature is not exercised, the surgeon may grasp for a star and pick up a jellyfish, may reach for a Juno and embrace a cloud.

Finally, the decision should be made by one who has a surgical conscience. Of late years the comparative safety of operations has, I fear, tended to lessen the sense of surgical responsibility. It is as true to-day as it was when Rabelais said it, generations ago, that "science without conscience is naught but ruin of the soul." Operating without conscience is not only ruin of the soul; it is often the ruin of the patient, and it is always to the infinite disgrace of the medical profession.

We said that the pathology of epilepsy is decidedly uncertain. Whereas in some cases there are depressions of bone, tumors, or adhesions between the cortex and its membranes, or some other obvious lesion, in many cases nothing at all can be discovered. The majority of observers believe that the essential trouble is in the cells of the cortex. In some cases diffuse meningoencephalitis has been demonstrated, and in others diffuse sclerosis of the cortex has been evident. Occasionally patients recover from epilepsy without any treatment at all. If cases are treated early and carefully and are placed under proper control, from 8 to 10 per cent. may be cured (Spratling). If the attacks of epilepsy have lasted over two years, or have been very violent, there is almost no hope of effecting a cure by medicine. At certain critical periods of life, such as dentition, puberty, adolescence, and the climacteric, the symptoms of epilepsy are prone to appear. At any of these periods epilepsy will sometimes be mitigated in intensity, will sometimes become aggravated, or occasionally will actually disappear after having been distinctly present. When there is organic brain disease or distinct mental failure, the prognosis is extremely bad. Hereditary tendency makes the prognosis worse, and distinctly traumatic cases afford the best prognoses. It may thus be seen that we are dealing with a distressing and usually incurable disease, which, as a rule, unfits the patient for the duties of active life, and which, as a general thing, gradually drags him into the ruin of dementia. In such a dreadful condition there is every justification for the performance of operation if operation even offers a chance.

In setting forth the surgical treatment of epilepsy, I shall not discuss the various peripheral operations that may be performed with the idea of eliminating a focus of irritation or of intercepting some irritant impulse. That such operations are occasionally beneficial is undoubted. I have seen great improvement or apparent cure follow the removal of a tender cicatrix, and follow the performance of circumcision in a case of phimosis. Nevertheless, the curative influence of such operations is occasional rather than common; and in the remarks that I make here I purpose to dwell particularly upon operations upon the skull and the brain.

The confidence in the curative value of brain operations in epilepsy has very much diminished in recent years. A few years ago it was claimed by some surgeons that operation is capable of curing from 60 to 70 per cent. of cases, but of late it has become evident that it can only cure a very small per cent. of cases. My own conviction is that less than 5 per cent. are cured by operation. Previous observers have been deceived by the fact that any operative traumatism may for a time improve, and even greatly improve, the manifestations of the epileptic condition. The administering of an anesthetic, the shock of an injury, the traumatism of an operation, just like a febrile seizure, may interrupt an epileptic habit and cause a patient to go for weeks or months without an attack. This phase of the question was most ably presented some years ago by Dr. J. William White, in his well-known article upon the curative effects of the operation *per se*. Misled by the apparently great benefit sometimes secured, cases have been reported as cured a few weeks or a few months after operation; but the subsequent history of such persons indicates that the attacks almost invariably return. A case should not be reported as cured until at least three years has elapsed since the operation was performed, and five years is probably a safer limit.

On carefully analyzing the statistics of well reported cases it becomes evident that certain sorts of cases offer a much better prognosis from operation than do others; hence the surgeon should not apply operation indiscriminately, but must recommend it only after careful study. I believe that a neurologist should, whenever possible, be associated with the surgeon in making the examination and in discussing the proper course of treatment. First of all, the history of the case must be accurately taken. Any hereditary tendency toward disease should, if possible, be discovered. A description of the first convulsion should always be obtained if possible, also its supposed cause. The question of injury, recent or old, is of the first importance. If in doubt as to head injury, the head should be shaved and the scalp examined for scars. The general health must be estimated; and, most particularly, convulsive seizures must be watched and studied by an expert. It will not do to accept the statement of the family as to the way in which the convulsions begin, how they manifest themselves, and the state in which they leave the patient for a time subsequent to the fit. I always insist upon the patient being brought into the hospital and kept under observation for the necessary length of time, so that several convulsive seizures may be seen either by a physician or by a nurse who has been trained and instructed as to what to look for and how to describe it. The fit should then be described in writing. Such a report will be a great help to the surgeon in reaching a conclusion. It is also to be borne in mind that, before undertaking an operation upon the skull or the brain, all sources of peripheral irritation should be corrected or removed.

IDIOPATHIC EPILEPSY.—Uncomplicated cases of essential epilepsy should not be operated upon, because operation will never bring about a cure. It is true that improvement may appear to follow the surgical procedure, but the improvement is only temporary, and an equal degree of temporary improvement might follow simple confinement to bed with regulation of the bowels and of the diet, the administering of an anesthetic, the performing of a peripheral operation, the inflicting of an accidental injury, or an attack of fever. Again, it is to be remembered that trephining in not a few cases makes the patient worse rather than better, and sometimes causes death.

IDIOPATHIC EPILEPSY WITH FOCAL SYMPTOMS.—Many of these cases, which begin within the first two years of life, are due to unrecognized cerebral infantile palsy. In such cases the fits may begin in and may be almost limited to one side. Some lay it down as a rule that most idiopathic epilepsies with focal phenomena once suffered from cerebral infantile palsy, although there may be no symptom of the palsy remaining. If, from the very start, the conclusive attacks had a local beginning, and if the surgeon has seen the case within two years of the first attack, it is proper to trephine and excise the irritated portion of the cortex. This is true whether the convulsions remain partial or spread to the rest of the body, and whether consciousness is lost or not. Operations in children are more hopeful than in adults. After the condition has persisted for two years, however, operation offers practically no hope of cure, as the association fibers are by that time hopelessly degenerated. But even in an old case, if the attacks occur with such frequency as to produce exhaustion and threaten life, the excited cortical center should be excised—not with any expectation of curing the disease, but simply with the hope of saving life. Excising the cortex cures very few cases of idiopathic focal epilepsy, probably not more than one or two per cent. It saves the lives of some patients, and it benefits many. After this operation a patient may go for months without a fit; but, unfortunately, the attacks almost always recur, because the scar that heals the brain wound becomes the source of persistent irritation, and because adhesions between the brain and its membranes also produce irritation. After the operation, however, the attacks rarely reach their former level of frequency, and they often prove more amenable to medical treatment.

TRAUMATIC EPILEPSY.—Every operation in traumatic epilepsy is exploratory. If a scar on the scalp is found, it should be excised. Dr. Keen has been so much impressed with the fact that irritating impulses from a scalp scar may induce epileptic attacks that, after having excised such a scar and having found that the bone under it shows no definite evidences of injury, he closes the wound and waits; if excising the scar fails to cure the patient, he then—and not until then—takes into consideration the advisability of performing some other operation. In focal epilepsy, with evidences of skull injury or depression, trephining is imperative and somewhat promising. The dura should invariably be opened, even if it seems in good condition. A dural scar should be extirpated.

When Jacksonian epilepsy has followed an injury in the motor region, the chances of effecting a cure are much better than they are when the epilepsy has followed an injury in the sensory region. When it has followed an injury in the frontal region, operation affords very little hope of cure.

THE POSTHEMIPLEGIC EPILEPSY OF ADULTS.—In these cases operation is entirely valueless.

The conclusions deducible from the preceding remarks are as follows:

Operations for epilepsy are distinctly disappointing and rarely curative, and are indicated in only a small proportion of cases, They may save life, but they are not entirely free from danger and occasionally leave the patient worse than before.

They frequently produce temporary benefit.

The mortality, though small, is not inconsiderable.

The actual number of complete recoveries is probably under five per cent.

No case should be claimed to have been cured until from three to five years has elapsed since the operation.

Even after operation medical treatment and supervision should be exercised for a long period of time.

The Psychological Aspects of Epilepsy.—DR. WM. P. SPRATLING, of Craig Colony, says that every true epileptic convulsion destroys or impairs the integrity of the faculties of the mind to some extent, the degree of which cannot be measured by the degree of motor violence that accompanies the attack. There are convulsions in which consciousness is completely lost, yet in which there is no evidence of muscular commotion in any part of the body. This is especially true of psychical epilepsy, which constitutes one of the most perplexing and interesting problems it is possible for the psychologist to encounter.

There is also a form of post-paroxysmal automatism very similar in character to psychical epilepsy. It is characterized by acts on the part of the patient that are apparently performed under the direction of conscious volition, yet all through the performance of which the patient is no more conscious of what he is about than if he were an inanimate machine.

On Icterus from Insect Bites and Gall-Bladder Diseases.—W. BAUEMEISTER (Therapeutische Monatschefte, May, 1904). Following the bites of various insects, a more or less extensive urticaria with general dyspeptic symptoms of a gastro-intestinal catarrh not infrequently occurs. Sometimes yellowness of the scleræ and of the skin demonstrates a duodenal catarrh. Reciprocal action of the skin and the intestinal tract is a common phenomena, but the latter is usually the first factor, as in herpes, furunculosis, etc. In the cases under consideration the trouble emanates in the skin. This is analogous to the occurrence of gastro-duodenal ulcerations after burns, for which the explanation is possibly some physical change in the bile (pleiochromia). Violent irritation of the skin may occasion gastro-intestinal ulcerations and lesser disturbances may cause a hyperemic swelling of the intestinal mucosa and a so-called catarrhal icterus. These effects of insect bites the author himself experienced. While visiting a University town in 1901 he was so bitten by bed-bugs that he had a severe urticaria lasting two weeks. The attack left him with dyspepsia and so depressed that he had to go to the mountains for recuperation. A violent acute gastro-enteritis compelled him to return home. While convalescing therefrom, he was suddenly seized with a gall-bladder colic, which recurred at frequent intervals and was accompanied by tension in the region of the liver and marked swelling of that organ. There was no icterus or marked excess of bile pigment in the urine. The cholecystitis lasted for months, despite the regular use of Carlsbad water. He then proceeded to a systematic disinfection of the biliary system, as the cholecystitis was dependent upon an infectious catarrh. For this purpose salicylic acid is our most effective remedy; it is in part excreted by the gall-bladder walls, the seat of the catarrhal process, and there develops its antiseptic action. An abundant flow of bile is the best natural antiseptic for the biliary passages, and to effect this we have no agents more powerful than salicylic acid and sodium oleate. The author had pills made up containing 1½ grains of each, and later added menthol and phenolphthalein as analeptics and to mildly stimulate intestinal activity. These pills, named probilin, are difficult to prepare, but they are easy to take. In the morning before breakfast and in the evening before retiring he took 3 to 4 pills, slowly drinking thereafter about a pint of hot water. After two 20-day courses of this treatment, with a fortnight's interval between, he gradually mastered the gall-bladder infection. He ascribes his recovery entirely to the disinfectant and cholagogue effect of this treatment and is strengthened in his conviction by the fact that he has succeeded during the past 18 months in practically curing between 60 and 70 cases of cholelithiasis with and without the passage of gall-stones: only two cases did he have to have operated. On the basis of these observations he states that the systematic use of salicylic acid with acid oleat of sodium will help when all other methods, such as Carlsbad, with and without rest, eunatrol, turpentine, olive oil, etc., do no good, and the sufferer is face to face with the knife. He details a number of his cases. The treatment is equally efficacious in some cases of bile stasis without concretion formation, i.e., as sometimes observed in cirrhosis of the liver. It appears in the form of a chronic cholangitis, with possibly a slight icterus and irregular intermittent fever, and slight chills, general malnutrition, etc. The exact reasons, for the increased passage of concretions under the probilin treatment is not clear. Two halves of a gall-stone, equal in size and weight, were immersed in plain water and a probilin solution. The first showed no change after several days, while the second was noticeably smaller and covered with a sticky slimy coating which the microscope showed to be composed of saponifying cholesterin crystals. The cholesterin rhomboids were softened and polypoid at their edges, showing that they were undergoing solution. The crystals were finally replaced by a mass of softened matter. While this may not occur to the same degree in the gall-bladder, it must do so to some extent, since both salicylic acid and soaps are excreted into the viscus. Laboratory reactions also show that not all concretions are equally subject to this solvent action. Bilirubin-lime stones, pea-sized examples of which are found not infrequently in the common duct, are recalcitrant to it. And since the salicylic-oleic acid medication acts on these also, its effects cannot be attributed to chemical solution alone. When the concretion is not simply entangled in the duodenal papillæ, so that it is washed down by the fluid from the stomach, the effect must be due to the increased vis a tergo from the cholagogue action of the remedy, together with the diminished mucosal swelling from the effect of the salicylic acid on the catarrhal process. In point of fact the softness and friability of the calculi found in the gall-bladder and ducts when operating on patients who had probilin, were very noticeable. In a postscript the author expresses his gratification at the fact that Dr. Kuhn, Chief Physician in the Elisabeth Hospital at Cassel, a well-known authority in hepatic disease, recommend in the Berliner Klinik of June, 1903, salicylic acid and oleat of sodium as the two most reliable drugs. In the Congress of Naturalists at Cassel, Kuhn reiterated his belief in their efficacy and advised the addition thereto of menthol, which is virtually the composition of probilin.

Fatal Ulcerative Stomatitis following Measles.—D. McKenzie, M.D. (British Journ. of Children's Diseases, Mar., p. 117). The author reports the history of a healthy, well-nourished girl, aged eighteen months, attacked with measles on March 2, 1903. The illness ran a moderate course without complication. On March 29 the writer was sent for because the temperature was 104°. There was a general rash resembling somewhat that of scarlet fever, but not definitely punctate. There was no sore throat. All the accessible lymphatic glands were enlarged. The pyrexia and rash persisted for 3 or 4 days; then the rash faded. During the next 8 days the temperature was subfebrile (from 97 to 99.8°). Then it gradually rose to 102°. On April 18 fine branny desquamation was visible. The lymphatic glands had become normal in size except 2 sub-maxillary glands on the left side, which were still large and hard. On the alveolar margin of the gum above the left lateral upper incisor was a round ulcer about 3 mm. in diameter, with a rough grey floor and undermined edges, surrounded by an areola of red and swollen mucous membrane. During the next few days the temperature remained high, the ulcer increased, and the submaxillary glands became larger and semi-fluctuating, while the surrounding tissues were hard and infiltrated. On April 24 the glandular abscess was opened and scraped under chloroform, about a tablespoonful of thick pus escaping. The ulcer was scraped with a sharp spoon, and the broken down tissue, which considerably exceeded the limits of the ulcer, reaching down to the periosteum, was removed. The resulting raw surface was painted with carbolic acid. Next day the roseolous rash recurred with a temperature over 104°, and diarrhea began. The abscess cavity slowly filled up, but the ulcer gradually increased in extent and depth. Curiously, the general condition markedly improved. The ulcer was again scraped and painted with carbolic acid. It was found to extend from the alveolar margin of the gum above the first and second incisor and canine teeth to the junction of the mucous membranes of the gum and cheek. On May 2, 10 days after the appearance of the second rash, desquamation was observed. On May 7 the ulcer was scraped a third time. Although the abscess cavity under the jaw had filled up and the wound seemed about to cicatrise, the whole left submaxillary region was occupied by a hard brawny mass, which extended across the middle line, and the submaxillary lymphatics were enlarged. The left cheek was red and edematous, and the breath foul.

On May 16 the rash appeared a third time, and was followed in due course by desquamation. During the next six weeks the local conditions underwent slow improvement. The ulcer ceased to spread, the cheek grew less inflamed, and the submaxillary induration showed signs of absorption. But the wound enlarged by disintegration of the subcutaneous connective tissue.

On June 17 there was evidence of intracranial mischief—vomiting, transient lapses of consciousness, photobia, retraction of the head, and stiffening of the erector spinæ muscles. Emaciation progressed rapidly. In a few days passing paresis of the right arm and leg appeared. Then clonic convulsions lasting 24 hours occurred, and were followed by coma, gradually deepening until death occurred on June 28. Treatment consisted in the exhibition of iron, arsenic, and cinchona. Potassium chlorate was given in 3 gr. doses 4 times a day, but without effect.

NECROPSY.—Examination of the brain only was permitted. The cerebral symptoms were found to have been caused by sinus thrombosis. A culture taken post-mortem from the alveolar abscess showed the staphylococcus pyogenes aureus. The roseolous rashes were presumably septic. Mr. Jonathan Hutchinson, Jr., reported a somewhat similar case in which, however, death seemed to have been due to miliary tuberculosis (Path. Soc. Trans., 1887, vol. xxxviii., p. 127). The patient was a child aged 21 months. Ulcers in the mouth existed for 9 months.

PEDIATRICS

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ORIGINAL ARTICLES

SYPHILIS IN CHILDREN[1]

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The frequency of syphilis in children no doubt varies considerably in different parts of the world and in different cites; and this variation depends partly on the frequency of acquired syphilis in the adult population, and partly on the possibility of securing thorough and effective treatment for the syphilitic adults in the particular locality. My own statistics would seem to show that amongst the children who are brought for hospital treatment in London congenital syphilis is not a very frequent condition amongst 4,830 consecutive out-patients at King's College Hospital in the Children's Department, where only children under the age of ten years are seen and where fully a third of the patients are under two years of age, there were only 29 cases of congenital syphilis, i.e., less than 1 per cent., or to be more exact, .6 per cent. These figures include only cases in which the presence of syphilis was beyond dispute; but even when doubtful cases are included, the proportion is not above 1.5 per cent.

Such statistics however give very little idea of the extent to which the inheritance of syphilis damages the community; to estimate this it would be necessary to have some record of the number of children who fail to reach live birth, or die shortly after birth, as a result of the syphilitic taint. Some idea perhaps of this early mortality amongst the children of syphilitic parents may be gained from the following figures in which only those still-births, miscarriages and early deaths are included which immediately preceded or followed, or formed part of a series immediately preceding or following, the birth of the patient in whose family history they occurred; there were 39 still-births, 36 miscarriages, and 25 deaths attributable to congenital syphilis in the family histories of 87 children who were under treatment for congenital syphilis; moreover, out of these 87 children 13 died whilst under observation.

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[1] Part of Symposium on Syphilis prepared for *Practitioner*, July, 1904. Courtesy of Editor.

I shall not consider in this paper the much rarer condition, acquired syphilis in children. The infection of a child after or during birth by contact with a syphilitic person who is still in the infective stage depends upon such a combination of favoring coincidences that it must necessarily be very rare; I have only seen two, or perhaps three, cases myself in which the possibility of such acquired syphilis could be entertained; it must be seldom indeed that such infection can be absolutely proved by the presence of a primary chancre on the child.

The symptoms of congenital syphilis are so well known, thanks to the writings of Diday, Fournier, Hutchinson, Coutts, and others, that it would serve no useful purpose to describe them here at length; the purpose of this article is rather to draw attention to certain points which have seemed to me to be of special interest or importance in connection with this disease.

Congenital syphilis is rarely detected at birth; but whilst it is true that there is nothing to draw attention to the disease at this period in the large majority of cases, it seems likely that manifestations are present at birth much more often than some writers have implied. This at any rate is certain, that a history of snuffles from the day of birth is obtained in a considerable proportion of cases (11 per cent. in a series of 100, as far as possible consecutive, cases of congenital syphilis under my own observation) and appears to be substantiated by careful inquiry; it seems almost certain also that some of the lesions in the fundus oculi which are frequent in congenital syphilis are intra-uterine in origin, and therefore are present at birth;

there is reason also to believe that the spleen in enlarged in some cases at the time of birth; and lastly, in 2 per cent. of my cases an eruption of blisters (syphilitic pemphigus) was present when the infant was born.

On the other hand, as is well known, the appearance of symptoms of congenital syphilis is remarkably delayed in some cases; for instance, in a girl aged 7½ years who came under treatment for synovitis of both knee-joints, no sign of syphilis has been detected until a month previously, when interstitial keratitis had appeared. In some of these cases no doubt earlier symptoms have been so slight that they have been overlooked, but in others where the child has been carefully watched there seems to have been no symptom whatever pointing to syphilis until the later years of childhood. In the majority of cases the disease shows itself much earlier; it my own series, 58 out of 77 in which this point was ascertained had shown well-marked manifestations of the disease within the first three months of life; in 31 out of these 58 characteristic symptoms were already present before the end of the first four weeks.

The most constant symptom is "snuffles," which was present in about 70 per cent. of the cases; but there is perhaps no symptom the diagnostic value of which may be so difficult to guage in any particular case as this coryza. A simple coryza giving rise to obstructed respiration is common enough in infants who have no taint of syphilis; moreover adenoids are sometimes present in infants only a few weeks old, and may be associated with running from the nose and snuffling respirtion. And again there are idiots, particularly those with small heads, for instance, microcephalic idiots and mongols, who in consequence of the smallness of the nasopharynx, and their special proneness to catarrh, repeatedly suffer with snuffles, although there may be no suspicion of syphilis. Even when snuffling is associated with undoubted congenital syphilis, it passes off in the majority of cases after a few weeks or months, and sometimes without any treatment whatever; it is only in a very small minority that it leads to deformity of the nose or to ozena.

Almost as constant in their occurrence are the skin-affections of congenital syphilis; 69 per cent. of my cases showed some characteristic skin-eruption, almost always within the first three months. A noticeable feature in many of these infants is the mixture of specific and non-specific skin-lesions which is often present and might easily mislead. It is not uncommon to find a very ordinary eczema in the fold of skin behind the ears, and sometimes over the scalp also, or here there may be a drier seborrhoic condition, whilst over the face and limbs there are characteristic brownish scaly dry patches of syphilitic eruption with other positive evidence of the disease elsewhere. In the groin also it is common to find a rawness or redness of the skin which differs in no way from an ordinary eczema or erythema intertrigo, although at the anus there may be condylomata, and further proof of syphilis in other parts. The rashes over the buttocks and perineum in congenital syphilis are often characteristic enough; but there are cases in which any distinction from the eruption produced simply by the local irritation of feces and urine is, I believe, impossible, and the real significance of the rash may be that the skin of a syphilitic child is particularly susceptible to irritating influences of any kind.

Laryngitis, shown by a hoarse aphonic cry in an infant under three months of age, is always suggestive of syphilis; it may occur after the child is already several years old, but I think is usually quite an early symptom. It was present in 14 per cent. of my cases. I have twice had the opportunity of examining the larynx in this condition after death: in one case at the age of four months where the hoarseness had been very marked during life, the only change detected was slight thickening and roughening of the mucous membrane over the arytenoid cartilages; there was no change in the cords. In the other at the age of eight weeks there was much thickening of the epiglottis, with some ulceration of the mucosa near its base; there was extensive ulceration of the vocal cords also, chiefly at the anterior part.

An important and often very early symptom of congenital syphilis is the acute epiphysitis which gives rise to the so-called "pseudo-paralysis" of limbs. It was present in 11 per cent. of my cases; in six out of eleven cases it began during the first three months; the earliest onset was at two weeks of age. Whether in all these cases of "pseudo-paralysis" epiphysitis is present, is perhaps doubtful it has been suggested that in some of them the symptoms are due to some lesion in the muscles or nerves. This much at any rate I can affirm from my own experience, that occasionally cases are seen in which, although these is well-marked pseudo-paralysis, no swelling or thickening about the epiphyses is detected, and in which it is difficult to localize the tenderness to any one part of the limb. Whatever may be the exact pathological condition, the symptoms usually disappear very rapidly under treatment with mercury internally; but occasionally suppuration takes place, where the epiphysitis is associated with undoubted syphilis; in such cases it seems possible that a secondary infection of the damaged tissues with pus-micro-organisms has taken place, and that the suppuration is rather an epiphenomenon than any part of the syphilitic process.

Among the bone-changes which are met with in congenital syphilis in older children perhaps the commonest is a syphilitic periostitis giving rise to thickening of the shaft of the bone, most commonly in the tibia, especially in the middle third, with a resulting slight curved projection forward of the edge of the bone here—the "sabre-tibia" of some writers—whilst the inner exposed surface feels unduly "massive." I mention this symptom specially in order to note its frequent association, in my experience, with the peculiar form of progressive mental degeneration which sometimes occurs in syphilitic children during the second half of childhood; but it is also not uncommon apart from this mental change, and may be the first evidence of congenital syphilis in later childhood, for instance, I have twice seen it as a first symptom in girls ten years of age.

That there are bone-changes in the skull as a result of congenital syphilis during infancy is agreed by all; but there is still some difference of opinion as to their relation to rachitic processes. There is no doubt that local deposits of spongy vascular bone are sometimes found in syphilitic infants, giving rise to areas of thickening on the parietal and frontal bones near the frontal and parietal eminences, or nearer to the anterior fontanelle; but is every infant with two or four symmetrical bosses on the vertex of the skull to be considered syphilitic? I can only say that after inquiring carefully into the symptoms and histories of many such cases, I am entirely unable to satisfy myself that any such pathognomonic significance is to be attached to these bosses, whether they are close to the fontanelle or whether they are further away. Undoubtedly they occur in syphilitic infants; undoubtedly, also they are sometimes the result of syphilis; but I think it is equally certain that bosses which are indistinguishable clinically from the syphilitic bosses may result from rickets alone. I say advisedly "indistinguishable clinically," for these bosses do not present the same appearances in their morbid anatomy in all cases, and it may be that the clinical manifestations represent two varieties of bony overgrowth, one syphilitic, the other rachitic, presenting anatomical differences in their mode of formation.

A similar doubt exists with regard to craniotabes; if that term be used to mean small patches of thinning of the calvarium, distant from the sutures, not merely diffuse thinning of the edges of the bones adjoining the sutures, I should say that it is much more often a manifestation of rickets than of syphilis. It is particularly frequent in association with laryngismus stridulus, a symptom which is almost always, if not always a symptom of rickets, and in these cases rapidly disappears under anti-rachitic treatment; on the other hand, it has been shown by Lees and Barlow[1] that congenital syphilis accompanies it in some cases (47 per cent. according to their observations), and these writers concluded that "syphilis is by far the largest factor in the causation of craniotabes."

As showing that congenital syphilis may cause extensive absorption of the bones of the skull, I may quote a case which was recently under my care:—Edward H., aged 10 months, was brought for a rash on the face, buttocks and head. He was slightly hoarse, and had condylomata about the anus; the fundus oculi showed choroido-retinitis; but the remarkable feature of the case was the presence just in front of the frontal eminences of two symmetrical gaps, one in each frontal bone, triangular in shape—the base of the triangle being above—and measuring about one inch in the transverse line of the forehead, whilst the distance from base to apex (which reached nearly half way down the forehead) was also about one inch. The bone appeared to be entirely absent in these areas, and I concluded—wrongly, as events proved—that it was an unusual example of congenital defect of ossification. The child was treated with mercury and iodide for the other syphilitic manifestations, and the course of a few weeks it was found that the holes in the frontal bones had completely disappeared, being filled up with hard thick bone with a somewhat uneven surface. No swelling of any sort had been noticed over these areas before the absorption of the bone; so that it was unlikely that it had been preceded by any gummatous deposit.

It has been stated positively that the characteristic teeth of congenital syphilis are seen only in the permanent dentition, never in the temporary set. I venture to think that, like most rules, this one also has its exceptions. A male infant, aged 14 months, was brought to me at the Hospital for Sick Children, Great Ormond Street, for screaming and colic. His central upper incisors were both of typical screwdrive shape, narrower at the edge than at the base; they showed at the cutting edge a well-marked shallow crescentic notch, and in addition showed that undue separation from one another which is common in syphilitic teeth. I do not think that a more characteristic specimen of syphilitic teeth could well be found; there was no other evidence of syphilis in the child, but the family history was suggestive—(i.) still-born at sixth month; (ii.) premature, 8 months' child, lived 9 weeks; (iii.) 7 months' child, deaf and dumb; (iv.) patient. Smale and Colyer,[2] in their treatise on "Diseases and Injuries of the Teeth," refer to a case recorded by Mr. Oakley Coles,[3] of "peg-shaped temporary teeth which were very characteristic, occurring in a child the mother of whom had long been the subject of syphilis." Referring to the central notch which is seen in the central incisors in the permanent teeth in congenital syphilis, the same writers point out that it "must not be solely relied upon in diagnosis, as it appears to be produced in teeth where there is not the slightest taint of congenital syphilis."

Joint-lesions are not very rare in congenital syphilis; a symmetrical synovitis was present in three of the 100 cases mentioned above, and one of these three showed also symmetrical synovitis of the ankles. But more obscure in its pathology is a curious affection of the joints which closely simulates osteo-arthritis. I have notes of four such cases; all were boys between the ages of five and twelve years, and in all there was limitation of movement in many joints, with some thickening about the joints, which in some certainly appeared to be due to osteophytic change; but there was also some thickening of soft tissues, probably of the capsule of the joint, and in one case at least there was probably fibrous adhesions in the joints. There was no enlargement of lymphatic glands, and in three of the cases the spleen could not be felt. In all the four cases there was some syphilitic eye-affection; three showed interstitial keratitis; one showed patches of choroidal atrophy. The joint-affection does not appear to be continuously progressive: the joints became affected successively during a period extending over several weeks or months, but apparently before antisyphilitic treatment had been commenced they had already become quiescent, leaving the movements of the joints more or less impaired. The thickening about the joints seemed to diminish very slowly, being still noticeable two or three years after the onset of the affection.

Of the visceral symptoms of congenital syphilis, enlargement of the spleen is probably the most frequent. My own figures showed enlargement in 30 out of 67 cases in which this point was investigated, a proportion which agrees with Dr. Gee's statistics, which showed 45 per cent. with splenic enlargement. Of the 30 cases mentioned, 14 showed extension of the spleen downwards as far as "one finger's breadth below the costal margin," 16 showed extension downwards varying from 1½to 3 fingers' breadths below the costal margin. How much importance is to be attached to mere palpability of the spleen, or even to its extending "one finger's breadth below the edge of the ribs," is a difficult question; it is certainly quite common to find the spleen extending thus far downwards in children with rickets, and sometimes the same condition is found without any assignable cause; it is clear also that even on the basis of statistics which show a higher percentage of splenic enlargement in congenital syphilis (for instance, those of Coutts[4] giving a proportion of 62 per cent.), there is still more than a third of the cases in which no enlargement is detected. It would seem, therefore, that no great stress can be laid upon the presence or absence of *slight* enlargement of the spleen as evidence for or against the presence of syphilis.

On the other hand, the occurrence of considerable splenic enlargement, say to the extent of two fingers' breadth or more below the costal margin, especially when this occurs before the age at which rickets is common, is, I think, valuable confirmatory evidence where there are other symptoms pointing to syphilis.

The virus of syphilis, whatever its nature may be, probably exerts some irritative action on the spleen, for in autopsies on infants with congenital syphilis there is frequently seen a recent capsulitis, and in later stages patches of thickening of the capsule and some increase of connective tissue in the substance of the organ, remain as evidence of past reaction; to these changes apparently the enlargement is due in some cases. Very rarely has any gummatous deposit been found in the spleen in children. I have elsewhere recorded two cases (one associated with lardàceous disease) and collected four other published instances. In some cases the enlargement of the spleen has been secondary to a syphilitic cirrhosis of the liver.

Attention has recently been drawn by Dr. G. Carpenter, Dr. Guthrie, Dr. Sutherland, and others, to the occurrence of nephritis in congenital syphilis. It would seem that an acute nephritis may be on of the earliest manifestations; Dr. Carpenter[5] has recorded two cases, one in which the autopsy showed acute nephritis at the age of five weeks, another in an infant who died at the age of five weeks, another in an infant who died at the age of five months. In an infant under my care, in whom general edema beginning at the age of six weeks was shown by autopsy to be due to acute nephritis, there were yellowish-brown shiny patches on the skin of the chin and upper lip, almost certainly syphilitic in origin; in another child who came under my care at the age of three years and ten months for ascites and nephritis, autopsy showed in addition to acute nephritis, chiefly of interstitial character, an intercellular cirrhosis of the liver which seemed to confirm the syphilitic nature of the nephritis. It seems probable that, as Dr. Guthrie has suggested, chronic interstitial nephritis in young children may also be the result of congenital syphilis.

Orchitis is not a very rare symptom of congenital syphilis, and being easily detected may be of value in the confirmation of diagnosis; for it is probably very rarely due to any other cause but syphilis when it occurs in an infant under the age of six months. It was present in 5 out of 64 male cases in my series: it occurred in three at the age of twelve weeks, and in the others at 4½ months and 12 months respectively; it was bilateral in all; in one only was the epididymis affected as well as the testes. The affected testes were much enlarged (two or three times the normal size), very hard, and showed very little tenderness. The condition rapidly subsided under mercurial treatment.

Seeing that the peritoneum over the spleen sometimes shows distinct imflammatory change in congenital syphilis, one might expect that occasionally a more general peritonitis would result; and this becomes more probable when it is admitted, as it is by some writers, that syphilis may cause peritonitis during intra-uterine life. By the kindness of Dr. A. E. Naish of Sheffield, I had the opportunity of examining the viscera of a still-born infant, whose birth had been hindered by fetal ascites. The intestines were found to be matted together by adhesions; the liver showed intercellular cirrhosis. There was no evidence of syphilis in the family history, but the condition of the liver made such a cause at least probable. Of syphilis, however, as a cause of acute peritonitis after birth very little is known; one case probably of this nature has been described by West[6] in a syphilitic infant whose abdomen became enlarged and extremely tender at the age of four weeks; but the peritonitis, if such it was, gradually subsided and the infant recovered. In an infant, aged four weeks, who was brought to me, with a well-marked syphilitic rash, the abdomen became distended and the child died in about 48 hours from the onset of symptoms; autopsy showed a very acute peritonitis with turbid serum and lymph in the pelvis; in the liver there was very advanced intercellular cirrhosis. Whether the peritonitis in this case was solely due to syphilis, or like the suppuration which sometimes occurs in a syphilitic epiphystitis was due to a superadded infection without any apparent source. is uncertain; but it seems at least possible that the association of acute peritonitis with syphilis was more than a coincidence.

A point of some practical importance is the relation of enlargement of lymphatic glands to congenital syphilis. It is not uncommon in children with this disease to find many of the superficial glands slightly enlarged so that they are easily palpable, but there is nothing in such a condition to differentiate it from similar palpability of glands which is often noticeable, especially in poorly nourished children, without any obvious cause and without any taint of syphilis; but there seems to be no doubt that occasionally a considerable local enlargement of glands, which might easily be mistaken for tubercular enlargement, occurs as a result of congenital syphilis, and that without any local source of irritation. Holt states that in his experience this adenitis is usually a late manifestation of congenital syphilis. Hutchinson[7] refers to one such case where the cervical glands became greatly enlarged in a girl of 15 years with interstitial keratitis, and the enlargement rapidly subsided under treatment with potassium iodide. In a boy aged eight years who was under treatment for several years at the Hospital for Sick Children, Great Ormond Street, for various syphilitic manifestations, including interstitial keratitis and gummata in the liver, there appeared at one time considerable enlargement of glands forming a visible tumor in one groin and palpable also in the iliac fossa; this subsided very rapidly on treatment with potassium iodide and mercury internally: there was no apparent local cause for the adenitis.

It is generally stated that the nervous system is but seldom affected in congenital syphilis, and perhaps in comparison with other manifestations of this disease it is true that the nervous affections are infrequent; but judging from my own experience I am inclined to think that they are less rare than has been supposed. Of children attending under my care as out-patients for congenital syphilis, 10 per cent. showed cerebral affections of one kind or another. Of 15 cases with well-marked congenital syphilis and affections of the brain, 4 were cases of progressive mental degeneration commencing at about 5-8 years of age; 3 were idiots from birth (one of these three was markedly microcephalic); 1 was hydrocephalic; 1 hemiplegic; and 3 died with tonic convulsions and coma, and were found to have chronic meningitis with extensive sclerosis of the cortex. It seems likely that even 10 per cent. is below the actual proportion, for I have not included some cases of cerebral palsy in which the history suggested the likelihood of congenital syphilis without sufficient evidence to make it certain. It is recognized also that some children with congenital syphilis become epileptic in the later years of childhood; and I would add that it is not uncommon for syphilitic infants to die with convulsions shortly after birth.

It has been customary in text-books to mention congenital syphilis as a cause of meningitis in infancy; but if by meningitis is meant a simple inflammation of the pia arachnoid—I mean, as distinct from the pachymeningitis with cortical sclerosis which was found in two of the cases mentioned above—then meningitis is certainly of extreme rarity in congenital syphilis. There can be little doubt that what was formerly described as a chronic basal meningitis due to syphilis in infants was identical with the disease which we now know as posterior basic meningitis or cerebro-spinal meningitis, and which, however chronic it may be, is the result of infection with known micro-organisms, and has no connection with syphilis, although there is of course no reason why it should not occur in a syphilitic infant. I have never seen such an association myself. But apart from this posterior basic meningitis which, as is now generally admitted, has nothing to do with syphilis, is there any form of lepto-meningitis (inflammation of the pia arachnoid) which can be attributed to inherited or congenital syphilis? Cases have been recorded in which syphilitic infants with microcephaly have shown thickening and adhesions of the pia mater—sometimes at the vertex, sometimes at the base—evidently the result of meningitis during intra-uterine life. I have more than once found adhesions and opaque thickening of the pia-arachnoid about the medulla and under surface of the cerebellum in cases of congenital hydrocephalus, where it seemed clear that there must have been meningitis before birth. In some such cases it seems certain that syphilis is the cause, in others it can only be suspected.

Sir Thomas Barlow[8] has recorded a case in which old thickening and calcification of the pia mater was found with arteritis and choroiditis in a syphilitic infant, aged 10 months, but here there was no history of definite meningitic symptoms at any time, and the date of the inflammation was quite uncertain. In a syphilitic boy, aged 11 years, who died after ten days of acute symptoms, I found a chronic inflammation of the pia mater, which was thick and opaque over parts of the vertex, and showed some thickening with adhesions in the Sylvian fissures and between the medulla and cerebellum; there was also some opacity of the membranes down the posterior surface of the spinal cord; but in this case as in the cases of chronic pachymeningitis there was also some sclerosis of the cortex.

A striking feature in all the nervous affections of congenital syphilis, and to a less extent with other manifestations of this disease in children, is the frequency of syphilitic eye-changes; in at least 21 per cent. of cases with or without nervous manifestations some syphilitic eye-affection was present; in 12 per cent. there was choroiditis: and these figures no doubt understate the frequency, for the point was not specially noted in all my series. With the nervous affections they are much more frequent, 10 out of 15 cases with cerebral manifestations showed some eye-affection, which in 9 out of the 10 was a choroiditis or choroido-retinitis; the remaining one showed only keratitis. These statistics, although they deal only with small numbers, may serve to emphasize the value of ophthalmoscopic examination in the diagnosis of congenital syphilis. In view of the intra-uterine onset of the eye-changes in some cases, it seems likely that in cases where, from the known presence of syphilis in the parents or in the other children, syphilis is probable in an infant, examination of the fundus oculi may be of value in determining whether antisyphilitic measures should be adopted before other symptoms have appeared.

Treatment.—The treatment of congenital syphilis is simple enough so far as choice of drugs is concerned; indeed, if the early manifestations only are to be considered there is no choice—mercury is the one essential. There are, however, two points which require consideration in the use of this drug, the mode of administration, and its duration.

The simplest and most convenient method in the large majority of cases is, I think, to give mercury by the mouth as grey powder. With this, as with any other form of mercury, the risk of producing diarrhea, perhaps in an infant already puny and wasted, as so many syphilitic infants are, has to be remembered; but it is, I think, avoided to some extent by giv ing small doses rather than the large doses recommended by some writers. Half a grain three times a day with a grain of Sod. Bicarb., and two grains of Pulv. Cretæ Aromat. can usually be given safely to an infant a few weeks old without causing diarrhea, and this dose is quite sufficient in many cases to cause a steady subsidence of symptoms. If there is a tendency to diarrhea the combination of grey powder with ⅛ to ½ grain of Pulv. Ipecac. Co., according to the age of the infant, may be used. Sometimes where half-grain doses of the mercurial have been sufficient to cause the symptoms of syphilis to disappear, fresh manifestations of the disease have appeared subsequently, although the infant was still taking the drug regularly. In such cases the dose may be increased to one grain three times a day, or, as suggested below, a combination of the internal with the external administration of mercury may be more useful.

Whether such small doses of grey powder are likely to affect the teeth subsequently, is, I think, very doubtful; but the possibility of such a result is at any rate a reason for using the smallest dose which is effectual. The risk of salivation or stomatitis from mercury is very small in infants; I have known it to occur only two or three times amongst a very large number of infants to whom mercury was given for one cause or another.

As an alternative—and one may be wanted, for there are infants who will vomit powders of any sort—the liquor hydrargyri Perchloridi is sometimes useful, and may be given in doses to 2 to 4 minims three or four time a day to an infant a few weeks old, and in doses of 10 minims or even more for an infant of six to twelve months. My own experience of this drug is that it produces looseness of the bowels more often than the grey powder does, and for this reason is less satisfactory. To prevent this it may be combined with small doses of castor oil, as in the following formula:—Liq. Hyd. Perchlor. m. iij; Ol. Ricini, m. iv; Mucilag. Acaciæ m. xv; Aq. Anethi ad. ℥ i; *ter die*, for an infant two months old; and, if necessary, Tinct. Camphoræ Co. in minute doses may be added.

Some observers have recommended calomel in doses of 1-12 to 1-6 grain twice or three times in the twenty-four hours, as a more rapidly effective form of mercury than grey powder;

its tendecy to cause diarrhea, however, is greater, and will probably necessitate the use of opium in some form.

Where rapidity of action is very important, as in the very severe cases, where an infant appears likely to succumb speedily to the intensity of the syphilitic virus, a combination of internal administration of grey powder with external administration by inunction of Unguentum Hydrargyri has seemed to me better than large or very frequent doses of the drug internally. I usually order a piece of the ointment the size of "the tip of the little finger," or of "an average green pea," which corresponds roughly to 15 grains; this is gently rubbed over the abdomen or the inside of the arm or thigh each night, and left covered with a flannel bandage till the next morning, when it is thoroughly washed off. The risk of dermatitis from inunction—albeit a small one, especially if the skin is properly cleansed after the application, and the area chosen is varied from day to day—makes this method, I think, less suitable as a routine treatment than the use of grey powder. As a cleaner method of external application warm baths containing about 10 grains of perchloride of mercury in about two gallons of water have been recommended. I have never used this method, which seems open to objection on account of the large quantities of corrosive sublimate which must be entrusted to unskilled and sometimes careless persons. No method of external application seems to allow of so accurate a control of dosage as the administration by mouth.

I shall make no reference to the intramuscular injections of mercury, and intravenous injections of iodine which have been used by some in congenital syphilis, except to state that in my opinion such methods can hardly be too strongly condemned, as an absolutely unnecessary infliction of pain, and involving an unjustifiable risk of inflammatory and septic complications.

The place of iodides in the treatment of congenital syphilis is a question of some importance. It is sometimes taught that mercury should be given to the infant and iodide to the elder child in congenital syphilis, on the general ground, no doubt, that the earlier symptoms are usually of "secondary," the latter of "tertiary" character. The two stages, however, do not necessarily correspond with any age limit, and there are certainly many cases in which potassium iodide is just as necessary for an infant as for an older child. Gummata are sometimes present in early infancy, and some of the bone-lesions, epiphysitis and periostitis, are, I think, often more successfully treated by a combination of iodide-treatment with mercury than with the mercurial alone. Potassium iodide is taken well by children, and in some of the lesions of later childhood where there is no response to small doses, the dose may be increased until 15 or 20 grains or even more are taken three or four times a day.

The duration of treatment with mercury is a point on which there is some difference of opinion. Mr. Hutchinson has laid great stress on the injury to teeth which results from prolonged administration of mercury during infancy; he would not continue the treatment much beyond the disappearance of symptoms. But in some cases this might mean administration of mercury for three or four weeks only, and so short a course of treatment is certainly not sufficient to prevent a recurrence of symptoms. I have seen fresh manifestations of syphilis occur in an infant after a very short interval each time the mercury was stopped in this way. A regular administration to the syphilitic infant for at least six months, and, if circumstances allow, for a whole twelvemonth, even where all symptoms are in abeyance after the first few weeks of the treatment, seems to be the most satisfactory routine.

Another matter to which reference must be made is the feeding of the syphilitic infant: and here I should like to insist upon the vital importance of breast-feeding for these infants. There seems to be a dread in the minds of some medical men that a mother may be infected by her own child when the child has congenital syphilis and the mother shows no sign of the disease: and I have sometimes found that a mother had been advised to stop suckling at once when it was found that the child had syphilis. Even if it be taken as proved—and the evidence is so slight that it can hardly be called proof—that exceptions have occurred to Colles' law that a mother cannot be infected by her infant when it has inherited syphilis, these exceptions must be so exceedingly rare that for practical purposes they may safely be disregarded. Moreover, there must be weighed against such an extremely small and doubtful risk the very real and great difference which breast-feeding makes in a syphilitic infant's chances of survival. Amongst the causes of death in congenital syphilis during infancy, one of the most frequent is marasmus: it would almost seem as if there were some inherent difficulty of assimilation in these infants at birth; some of them waste almost from the day they are born, although no other evidence of syphilis may be apparent until wasting is already advanced; and the marasmus often occurs without any obvious gastro-intestinal disturbance in an infant who is properly fed at the breast. Apart, however, from this tendency to marasmus, there seems to be a special liability also to gastro-intestinal disorders; a large proportion of the infants who come under treatment for congenital syphilis are brought, not for any specific manifestations, but for persistent digestive disorder in spite of careful feeding. It is therefore all-important that the food should be as easy of assimilation as possible, and for this reason no method of artificial feeding can replace the mother's milk. To deprive the syphilitic infant of its mother's milk may be to deprive it of its chance of life. Suckling, however, can only be done by the mother: no wet-nurse must be allowed to suckle an infant with congenital syphilis, for however rare infection from congenital syphilis may be, it seems clear that a wet-nurse can be, and in several cases has been, infected by suckling an infant who had this disease.

Lastly, I would point out that apart from the marasmus to which I have referred, not only infants but also older children with congenital syphilis are so often poorly-nourished, pale and "unwholesome-looking" even when free from any definite manifestations of the disease, that good food, and perhaps malt and cod-liver oil, sea-air and good hygiene in general, play no unimportant part in the treatment of syphilis in children.

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SOME NOTES ON THE CARE OF PREMATURE INFANTS*

By Dr. V. P. Blair.

I feel some diffidence in reading a paper on this subject before men who have had a life-time's observation in the care of infants.

While through the kindness of my friends, I have had some opportunity of working with the premature-born, still the difference in the care of these infants and those born at term is one of degree and not kind. The same general principles underlie both. These differences while only of degree are with the earlier and more delicate infants of the greatest importance. Apparently very slight inaccuracies or indiscretions often cause a fatal result. If you will consider the number of possible contingencies that may arise in the course of their extra-uterine life, protection from which nature as yet has not provided them, and which if we would be successful in this line of work, we must forestall, I believe you will grant me the privilege of considering a few points of the subject with you, that I at least may be the gainer by the discussion.

The rule that the best mechanic needs the fewest tools, and the best doctors the fewest drugs holds good here, and many a very young child has been raised successfully without other help than a warm room and a careful nurse, and due regard for the ordinary principles of infants' care. However, it is generally conceded that by special apparatus the temperature of the warm room can be made equable, and that the more perfect the apparatus the more remote may be made the possible contingencies; but it is only in as much as the operation of the apparatus conforms to the general principles of infants' care, applicable to the particular case, that it is good. It will but partially supplant watchful care, but will give watchful care a chance to be of some use, where possibly without it the best energies would amount to nil.

It will not save the hopelessly diseased or functionless infant, but may help to bridge over a period of poisoning, or incomplete functions, that would prove fatal in a few hours were the child exposed to the ordinary vicissitudes of life.

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The incubator I prefer is described in the *Medical Fortnightly*, St. Louis, June, 1903.

I will not refer to other incubators, or to the work of other men in this line; I do not claim that any of this work is original, but will state that everything I give you has been confirmed by personal observation, and the incubator is the result of this observation.

All babies must have sufficiently warm, sufficiently moist and sufficiently pure air. They require sufficient stimulation to carry on the requisite functions of life. Their exposure to infection must be relatively limited, and their food must be in an easy assimilable form.

With the premature infant the air must be of a higher temperature and the variations held within much closer limits. The moisture must be greater and more constant and the purity of the air in proportion.

The child's resistance to infection is reduced, and the time at which stimulation changes to irritation, and nourishment to poison, is but ill defined. The younger the infant the closer are the limits of variation.

There are a certain number of premature infants which either through intoxication or lack of functions, are unable to continue extra-uterine life, in spite of any help that is at our command. There are a great number, however, that will give us an opportunity of exercising a greater or less degree of skill and cunning, a certain portion of which will reward us for our efforts.

As all doubtful cases should be treated with regard to their worst possibilities, so all premature infants should be treated as if they were the most delicate until they prove themselves otherwise.

The difference between the relatively strong and the weak is so slight, the difficulty of its recognition so great, and the time of change from health to death so short, that this is absolutely necessary.

It is not always possible to have an ideally equipped incubator at the time of the appearance of the child, but it is always possible to have some sort of a makeshift that will, in many cases, suffice to carry the child until the proper machine is procured. The great point is that the child should be not necessarily surrounded by and come in contact with hot bottles, but that it should breathe warm air of about 100 degrees F. at the start. This is a very important distinction.

The infant may be placed in a basket and suspended sufficiently near a stove or over a radiator of the proper temperature, but this is not the best plan. It should be placed down in some compartment where the temperature can be controlled, and where there is sufficient space between the child and the roof of the compartment to allow a free circulation of warm air, thus fulfilling the requisite, which I mentioned before, that it should breathe the warm air.

I show you here an easily constructed and rather efficient improvised brooder. It consists of a box of some 20 inches deep, and of sufficient width and length to contain a pillow and have some room to spare.

In this box is placed a sheet and blanket with the edges protruding from the box in all directions. We will remove one side to demonstrate the interior arrangement. Next is placed a pillow so as to slope at an angle. At each end of the box is placed a row of bottles of hot water. A thermometer, if available, is hung inside, and the whole covered with the blanket with the exception of an inch space at the end of the box, corresponding to the higher level of the pillow and to the feet of the infant. The infant, wrapped in cotton, is placed on the inclining pillow, head downward, on its right side, and fastened by its wrappings so that it may not slide down and bring pressure upon the vertex.

An even temperature may be had by filling alternate bottles with hot water as may be required. And some moisture may be supplied by hanging a wet handkerchief over the bottles at one end.

The external box of this apparatus may be replaced by a barrel, a bath tub, a deep basket, or the space between two broom sticks and two chairs, and I have found a bureau drawer with a hot water bag an efficient substitute for the whole thing when the emergencies demanded.

The incubator is large, with the opening in the top and with two hand holes in one of the side plates, through which the lesser manipulations of feeding, changing, etc., can be conducted.

The heat is derived from a lamp and is distributed by secondary radiation from a copper radiator that contains twelve gallons of water, and has 2,000 square inches of radiating surface. The air is filtered through gauze before entering the machine, and is moistened by being exposed to a body of warm water, with a surface area of from 80 to 400 square inches, as desired.

The circulation of the air is maintained by gravity, and will cease entirely when the temperature outside is equal to that inside the incubator, when the door in the top is left wide open.

It is furnished with both a lamp and a Bunsen burner. The lamp will maintain the more equable temperature, and when properly cared for gives no odor. To facilitate this, duplicate burners are furnished with each lamp.

Three thermometers are furnished with each outfit, one fixed in the radiator, one to take the temperature of the food, baths, etc., and the third hanging in the living chamber is of a kind that registers the highest and the lowest temperature attained so that the physician can know at each visit what variations has occurred.

The bed to which the mattress is attached is movable and the chamber is sufficiently large to allow it to be placed at any desired inclination. All the parts are movable and can be easily gotten at for repair or cleaning. It is sterilized by disintegrating one ounce of formol over an alcohol lamp in the living chamber, closing all apertures, and placing the cover over the incubator for six hours, to be followed by the disintegration of four ounces of aqua ammonia in the same manner to destroy the paraformol.

Whenever possible the machine should be set up and running before actually needed, as this gives the nurse familiarity with its adjustment and places it in readiness when needed. This is greatly to be desired. In many cases, however, some emergency makeshift will have to be resorted to until the regular machine can be procured.

As soon as the child is resuscitated, it is, unwashed, smeared with warm oil, wrapped in absorbent cotton and pinned on its right side in the incubator, which should be at a temperature of 100 degrees F.

If there is a weakness or irregularity in breathing, the foot of the bed should be elevated to from 20 to 90 degrees. The child should then stop crying and assume a rather crimson hue and go to sleep. Restlessness and a rise of temperature of above 102 degrees should be the indication for gradually lowering the temperature of the incubator; in five or six hours after birth water to drink should be given.

In resuscitating the more delicate ones, I believe that suspension, head downwards with alternate compression and expansion of the chest, and alternate douchings with hot and cold water has some advantages over the more violent methods of Schultz and Silvester.

After clear. breathing has once been established the child should be removed from the warm chamber for apnœa and suspension, and if necessary the injection of strychnin given at the maximum rate of 1-4000 of a grain to every pound of body weight and baths should be relied upon.

The child that is in need of artificial heat, at first cries lustily, and the color will gradually assume a blueish and then a greenish tinge. There is a gradually decreasing temperature and the cries weaken until they finally cease. The cessation of the cry of such infants should always arouse the gravest apprehension, and we should not be satisfied until we are sure by other signs that the child is doing well.

Normal infants at term have a reserve that will maintain heat and vitality for some twenty-four to forty-eight hours, until the time for feeding comes, while early, premature infants are equal to but a few hours, therefore the age at which urgent symptoms arise is in proportion to the age and the strength of the child. While a six months' infant in most cases would not survive after an exposure of two hours to a temperature of 80 degrees, an eight-month infant might do well for two days and then not be able to appropriate nourishment sufficiently rapid to maintain its body temperature, after the reserve had been exhausted. It is to bridge over this period that the incubator is called into play, and it will be necessary for months or days, according to the condition present.

I would never place a child in the incubator without covering. The covering I prefer is a combination of a triangularly folded napkin lined with absorbent cotton. The child is laid with its head beyond the broad-folded edge of the napkin, with the cotton next to the skin. The two lateral corners are folded over it, including the arms. Now the lower corner is brought up over the feet and all fastened with one or two safety pins. This prevents the child from bringing cotton into its mouth, gives a firm support for suspension, and it is not necessary to remove the entire wrapping every time, to make changes, unfastening the lower corner often being sufficient. It should be snug at the neck, and otherwise loose enough to allow motion of the limbs.

In vertical or nearly vertical suspension some means must be provided so that the child's weight does not rest entirely on its shoulders, thus compressing the chest.

The temperature of the incubator must be regulated according to the needs of the child, and after it is first placed in, at a temperature of 100 degrees, the probabilities are that this heat will soon have to be lowered. The indications are the color, comfort and temperature of the child. The child's temperature may be safely maintained at a temperature of 100 degrees to 102 degrees, and it seems to stand 105 degrees for hours without damage, and as a rule I would never allow it to go below 99½ degrees.

Exceptions must be taken in cases of children in which the sweat glands are well developed. While the body heat of younger subjects is dependent upon, and may be entirely controlled by external temperature, when the functions of sweating is established, persistent attempts to raise the infant's temperature will often cause profuse perspiration, sudamina, eczema, heat depression, diarrhea, etc. If, especially within the first hours after birth, the child is of a dark, dusky red or reddish purple, but not blueish yellow or green, is not breathing well and upon inclining it head downwards, the head and face become congested with venus blood and at the same time the body temperature is 99 degrees or over, it is proper to cautiously lower the incubator a few degrees and give warm baths in hopes of stimulating the lagging heart.

Strychnin in smaller doses, 1-2000 of a grain, may be given hypodermically and cautiously repeated. It is, however, a very unpromising condition.

When the child is maintained at the proper temperature, other things being equal, it assumes a crimson color and sleeps quietly. When the temperature in the incubator is too high and the child's temperature reaches 104 and 105 degrees, it becomes restless, but does not as a rule cry. When the temperature of the incubator is too low the child's temperature falls to normal or below, it draws up its knees, cries and assumes a pale or blueish green color; 93 to 97 degrees in the sixth and seventh months, 88 to 95 degrees in the eighth and 80 to 90 degrees in the ninth ow month are average temperatures for the incubator. In all cases from hour to hour and day to day the incubator must be regulated according to the demands of the child. Besides the actual temperature of the child's body, the temperature of the extremities must be watched. Cold hands or cold feet are due to one of the three following causes, and should always be corrected and at once, as they bring about internal congestion, which is followed by mucus in the respiratory or intestinal tract. The condition is due generally to a low incubator temperature, colic or poor circulation.

When a child is removed from an incubator the temperature has gradually been reduced to about that of the room in which it is to live, and it is removed for a longer and longer time at the feeding periods.

The importance of feeding needs no comment. Where possible, breast milk should be used, preferably from a woman with a month to three-months-old child. It should be given diluted, starting with a percentage of one-half per cent. proteid, 1 per cent. fat, 4 to 6 per cent. milk and 6 per cent. sugar and increasing as demands and digestion warrant. Where artificial food is necessary the following plan is good as a start:

A solution of 1 per cent. soluble proteid and 2 per cent. fat (with the least possibility of casein) and 6 per cent. sugar is peptonized for forty minutes, is given in dilutions of one, two or three parts of 6 per cent. sugar solutions or pure as required. If necessary the casein that was in the cream may be curdled with rennet before peptonizing.

Rotch's caution to keep strength and quantity slightly below the child's capacity should be observed, but always remember certain gastro-intestinal disturbances are best treated by increasing the strength of the food.

We often have to deal with an apparent vicious circle, in as much as digestion and nutrition is impeded by the high temperature (as in the case of summer heat); but the child is not yet able to assimilate sufficient to maintain its bodily heat at a low atmospheric temperature, yet it cannot have a low atmospheric temperature till it can do so. However, the circle is not absolutely complete, so that by care in feeding, and by gradually and cautiously reducing the incubator temperature, and by regularly bathing, one, two or three times a day, we will reach the point where the child can maintain itself at a normal house temperature.

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s of food range from one-half drachm to 2 ounces as
h progresses, and the intervals from one hour to an hour
d three-quarters in the day time and from two to three hours
at night.

As a rule feeding should be begun with at least sugar solution, in six hours after birth. Young infants cannot nurse. I have never used gravage, and would consider it a grave expedient. Fluids dropped far back in the child's mouth from a medicine dropper have always been swallowed, the food should be given very slowly and time to rest allowed between every several swallows. Later a rubber nipple or the breast is to be substituted, but when used too early they do not satisfy, and produce hiccoughing and intestinal disturbances. Water should always be offered the child if awake between feedings.

Asepsis should be as nearly absolute as possible, should cover every point from the thermometer that tests the food, to the nurse's hands and the bath water. Everything should be treated as for a surgical operation.

Stimulation: Strychnin and whisky will be considered under medication. Food and bathing are the means that should be ordinarily employed.

Food of the proper kind given at the proper intervals, together with the inspiration of air 25 degrees below body temperature, and the reaction of voluntary muscles' action, are normally sufficient stimulation to excite all of the functions, but in the incubator the temperature is held high, which is enervating, and voluntary movements are slight, so that the food by itself does not always suffice.

My sheet anchor is bathing, and I resort to it as soon as I find there is exhibited a lack of co-ordination in the function, and do it as a routine practice after the first or second week of mundane life. Of course, if carelessly done, it could be immediately fatal, but the following method is, I believe, absolutely without danger:

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Rotch's caution to keep strength and quantity slightly below the child's capacity should be observed, but always remember certain gastro-intestinal disturbances are best treated by increasing the strength of the food.

We often have to deal with an apparent vicious circle, in as much as digestion and nutrition is impeded by the high temperature (as in the case of summer heat); but the child is not yet able to assimilate sufficient to maintain its bodily heat at a low atmospheric temperature, yet it cannot have a low atmospheric temperature till it can do so. However, the circle is not absolutely complete, so that by care in feeding, and by gradually and cautiously reducing the incubator temperature, and by regularly bathing, one, two or three times a day, we will reach the point where the child can maintain itself at a normal house temperature.

Where the child is not sufficiently nourished by this mixture, or by breast milk that it is able to take care of, besides other expedients I have found it advantageous to add a small quantity of beef peptone, most conveniently in the form of panopeptone, from one to five drops to the feeding. I have had to rely on panopeptone entirely for two days at a time in severe gastro-intestinal disturbances. This was with an artificially fed child. The quantities of food range from one-half drachm to 2 ounces as growth progresses, and the intervals from one hour to an hour and three-quarters in the day time and from two to three hours at night.

As a rule feeding should be begun with at least sugar solution, in six hours after birth. Young infants cannot nurse. I have never used gravage, and would consider it a grave expedient. Fluids dropped far back in the child's mouth from a medicine dropper have always been swallowed, the food should be given very slowly and time to rest allowed between every several swallows. Later a rubber nipple or the breast is to be substituted, but when used too early they do not satisfy, and produce hiccoughing and intestinal disturbances. Water should always be offered the child if awake between feedings.

Asepsis should be as nearly absolute as possible, should cover every point from the thermometer that tests the food, to the nurse's hands and the bath water. Everything should be treated as for a surgical operation.

Stimulation: Strychnin and whisky will be considered under medication. Food and bathing are the means that should be ordinarily employed.

Food of the proper kind given at the proper intervals, together with the inspiration of air 25 degrees below body temperature, and the reaction of voluntary muscles' action, are normally sufficient stimulation to excite all of the functions, but in the incubator the temperature is held high, which is enervating, and voluntary movements are slight, so that the food by itself does not always suffice.

My sheet anchor is bathing, and I resort to it as soon as I find there is exhibited a lack of co-ordination in the function, and do it as a routine practice after the first or second week of mundane life. Of course, if carelessly done, it could be immediately fatal, but the following method is, I believe, absolutely without danger:

Before the feeding time a small basin of water of the temperature of 100 degrees to 103 degrees F. is placed in the incubator alongside the child, the nurse having provided herself, within easy reach, with fresh wrappings and a soft towel wrapped around separate bottles. Through the upper opening the napkin, but not the cotton, is removed and the child emersed in the bath, the nurse holding the head and shoulders with one hand and splashing the cotton covering with the other, using some friction with the wet cotton up the spine and extremities of the child. When it is to be removed the child is lifted out of the cotton and placed in the warm towel which lies right next to the tub and is quickly dried. This towel should be thick. The child is greased and replaced in warm wrappings, and the process, which is to be immediately followed by feeding is complete. One or three baths may be given a day, and so timed as to strike the periods of greatest depression, one of which often occurs about five in the afternoon.

Bathing is corrective of poor circulation, a disinclination to take food at the proper time, inability to go sufficiently long between feedings, cold extremities and the condition known as "cold," whether intestinal or bronchial, and by it we may break the vicious circle of insufficient innervation.

Ordinary baths should be 103 for two minutes, for the condition of "cold" it should be 100 degrees for one minute. For poor reaction the temperature may have to be raised; for severe colic 105 to 107 degrees.

A child that is regularly bathed more quickly accommodates to a decreasing incubator temperature.

Massage is limited to the abdomen when necessary to assist in expelling gas or mucus.

Even on these patients proper medication is of advantage. For acute and severe depressions, strychnin sulphate, 1-4000 of a grain or more hypodermatically to every pound of body weight should be given, or a few drops of whisky may seem less heroic.

In states of listless depression that occur without apparent cause, I do not hesitate to use strychnin and leave such orders with the nurse.

It must be remembered that in these infants the slightest irregularities may become rapidly fatal. Whisky with milk of asafetida will relieve lesser colics, while graver ones demand vigorous abdominal massage with hot oil and maybe paregoric, in one-fourth to one-half drop doses, dropped from the rim of an ounce bottle, to every pound of body weight.

Paregoric should always be followed by castor oil. These children stand castor oil well, and should be given from ten drops up as often as every three days in subacute intestinal disorders.

When a child in an incubator cries an investigation should be made, first to see if it is dry, next if its hands and feet are warm, and if between cries its abdomen is soft. The time of its next feeding should be considered, and a clean finger placed in the child's mouth will often differentiate between hunger and colic. If hungry, water should be given the child to carry it, if possible to the next feeding. Crying before several consecutive feedings, means either that the interval is too long, the quantity too small or that the child is not assimilating the food.

The problem of inco-ordination of functions is sufficiently important and perplexing to merit notice, but too deep to be dealt with in this paper.

I will suggest the following hints: Mucus in the intestines does not necessarily mean the food should be withheld or cut down.

These children have little reserve and will not stand it. Possibly the food should be increased to give strength, and certainly a more stimulating food, such as raw breast milk, or an increase of beef peptones, should be tried. Bear in mind that the meconium persists for days and that mucus may be many hours old.

Cold extremities with low body temperature demand more atmospheric heat, but occurring with proper body temperature (101½ or over), stimulation with investigation for intestinal irritation are indicated. Sneezing and coughing usually demand a raise of incubator temperature, but with proper stimulation. For sweating, incubator temperature should be lowered.

Bathing, backed by proper temperature and food, is the best means to re-establish the co-ordinate functions.

As far as I have had a chance to observe incubator babies make healthy children. The regular habits established may be utilized in later life, and they do credit to the process.

In order to be successful the first requisite is that the child be placed in the incubator alive, for which possibility we are in most cases dependent upon the nurse rather than the doctors, therefore, if we wish to save these babies we must start by instructing our nurses in the exact technique of first aid. I say exact technique advisably, for this is a most critical period and one cannot be too careful.

In the past month, in five of the cases I have been asked to care for, in which no provision was made before the birth of the child, four of them died before an incubator could be brought into operation, in spite of the fact that in two cases at least every possible precaution was taken.

This is not far out of line with the bulk of my observation, and is my excuse for the length of time I have dwelt on this part of the subject.

Before closing I want to make a plea for an incubator or an improvised hot box in other conditions besides prematurity. The treatment of marasmus and of gastro-intestinal disturbances of infancy is much simplified in many cases if we are able to lessen the work of digestion, by the amount of food required to maintain the body heat, and I believe no one who has ever treated bronchitis or a broncho-pneumonia in the even, warm, moist atmosphere of an incubator will ever be willing to trade it for the poultice or the hot water bag.

COMPLETE AND PARTIAL URETERAL DUPLICITY

By Byron Robinson, B.S., M.D., of Chicago

In the recent rapid rise and general application of medicine and surgery to the ureter it may be well to pause, to take an inventory of the knowledge we possess as regards the ureter in order that it may be utilized to avoid failures and disasters.

The physiology and function of the ureter is peristalsis, absorption and secretion. The object of the ureter is to transport urine from kidney to bladder by rhythmical contraction and to prevent its return by the uretero-vesical valve. The ureteral ducts generally perform their rhythm uninterruptedly if their walls are not damaged (paresis, inflammation) or their lumen is not compromised (stricture, calculus). The present anatomic construction of the ureter in man from heritage of the Wolffian body and environments consist of three dilatations, reservoirs (proxial, middle and distal) and 3 constrictions, isthmuses (proximal, middle and distal). These ureteral constrictions serve as secure lodging places for calculus.

Since the ureter arises from a composite organ (Wolffian body) and since its completion occurs late in embryonic life it is subject to remarkably numerous anomalies chief among which is duplicity. In this brief article I wish to present 9 complete duplicate ureters and 11 partially duplicate ureters drawn from specimens which I have secured during the past two years.

The lessons to be learned from these ureteral duplicities may be utilized in X-raying for calculus, in catheterization, in cystoscopy in short in avoiding failures or disaster in ureteral labors. That I could collect within a few years, with but little effort a score of examples of ureteral duplicities is ample evidence of their frequent occurrence. In fact in 100 autopsies where I made individual observation 6 per cent of ureteral duplicity occurred. I searched almost every one of the 50 volumes of the Transactions of the London Pathological Society and found reports of 4 complete duplicate ureters, and 2 of these were bilaterally duplicate. Dr. Henry Decherd reported 2 cases of bilaterally duplicate ureters. Dr. A. H. Gould searched the literature and found 8 cases to which he added 2 cases. Bostroem reported 100 cases. I hereby add one case. In searching the 50 volumes of the Transactions of the London Pathologic Society I found bilateral duplicate ureters mentioned twice. This makes 24 cases of bilaterally duplicate ureters. Unilateral duplicate ureters are much more common. Partially duplicate ureters are quite common.

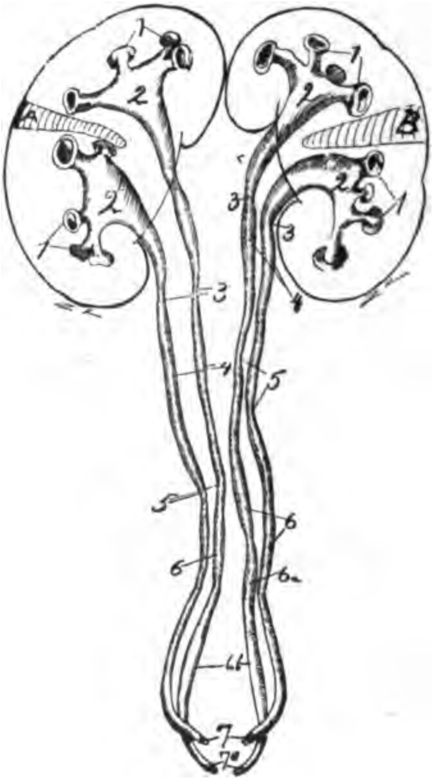

Fig. 1.

Bilaterally duplicate ureters. The uretral calyces and pelves are separated by a renal wedge (A, B). 1, calyces; 2, pelves; 3, proximal, 5, middle, and 7, distal isthmuses; 2, proximal, 4, lumbar, and 6, pelvic dilatation. The ureters cross each other in the lesser pelvis. This specimen was presented to me by Dr. William Fuller.

Among ureteral malformations the most frequent anomaly is ureteral duplicity. The ureteral duplicity occurs at its proximal end, resulting in partial or complete duplicity. I have so far observed no illustration or description of a ureter partially duplicate at its distal end. Duplicity of one ureter is liable to be shared by the other.

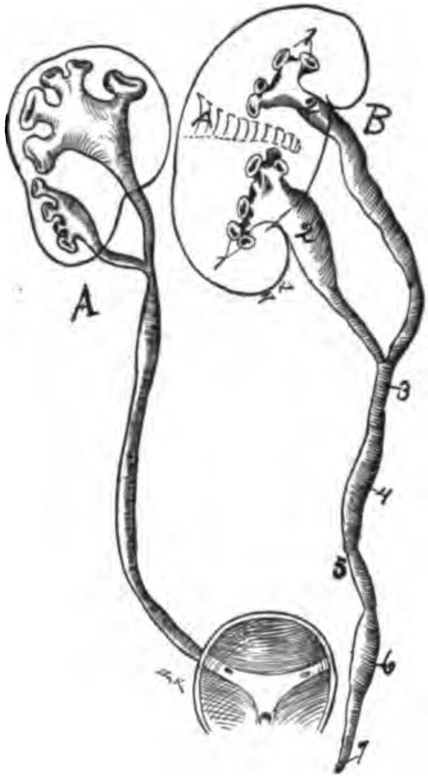

FIG. 2.

Two partially duplicate ureters from different subjects. A, on the left, man, aged 39. The specimen was presented to me by Dr. H. G. Harris. B, on the right, a specimen presented to me by Dr. Duchett. Fig. B presents a renal wedge; Fig. A presents none. As is usual, the proximal calyces and pelvis are smaller than the distal; however, this is reversed in Fig. 1, A. The ureteral dilatations, reservoirs (1,1 and 2, 4, 6), and ureteral isthmuses constrictions (3, 5, 7), are normally located.

Ureteral Crossings.—The ureters are spiral ducts, and when a ureter is completely duplicate the ducts cross each other mainly in the lesser pelvis. In the 9 complete duplicate ureters here presented 8 were known to cross each other, while the ninth was uncertain from the method of dissection of the specimen, but was believed to present a crossing. The location of complete duplicate ureters is the following: The distal ureter crosses ventral to the proximal ureter in the region of the

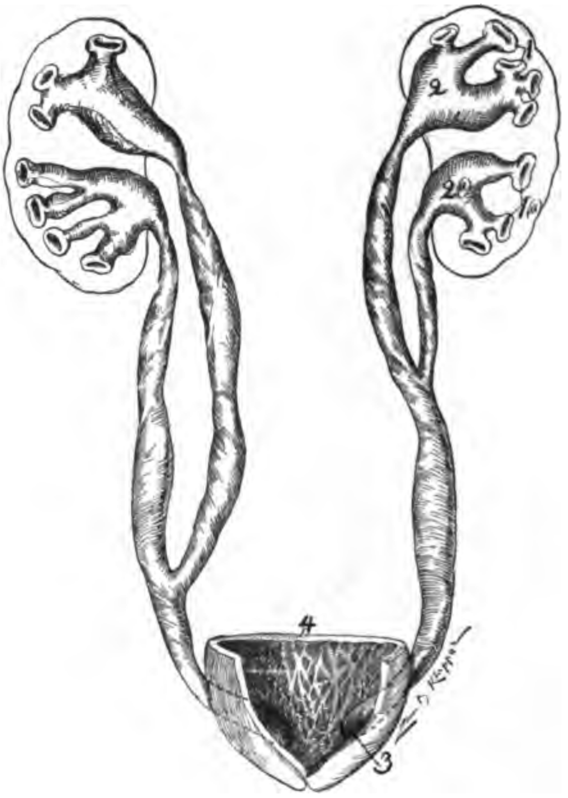

FIG. 3.

Bilaterally partially duplicate ureters with extensive dilatations due to urethral obstruction. The calyces (1, 1a), pelves (2, 2a), ureter proper, and bladder produce one continuous patent channel—the uretero-vesical valve is lost. The bladder is prominently trabecular. The ureters do not bifurcate at the same bilateral location, 1a, 2a, distal calyces and pelvis. Partial urethral obstruction produces general ureteral dilation with parietal hypertrophy. Specimens presented to me by Dr. A. M. Stober.

lesser pelvis and ends in the lateral angle of the vesical trigone proximalward and lateralward to that of the proximal ureter. The proximal ureter crosses dorsal to the distal ureter in the region of the lesser pelvis and ends at a point within the trigone medianward and distalward to that of the distal ureter.

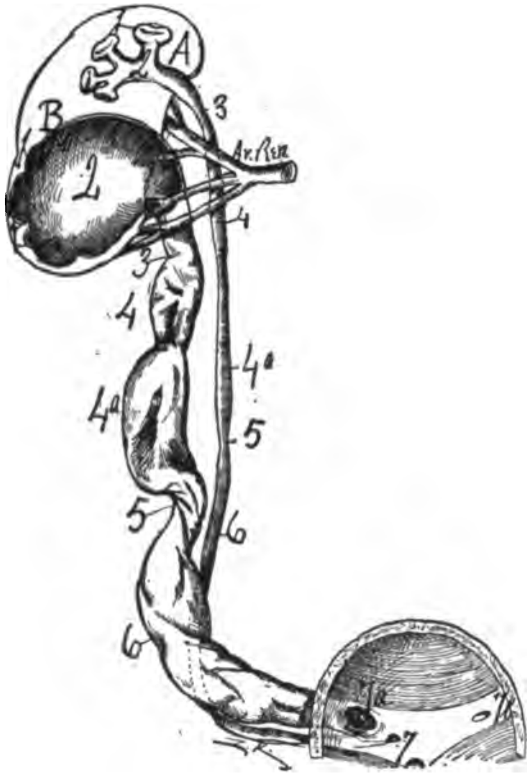

Fig. 4.

Complete ureteral duplicity. The proximal ureter (A) presents reduced calyces (1) and pelvis (2), with moderately marked isthmuses (3, 5, 7) and dilatations (2, 4, 6). The proximal ureter has its vesical orifice located medianward and distalward to the orifice of the distal ureter. The distal ureter (B) is a hydro-ureter with a coecal or blind vesical end. The ureteral dilatations reservoirs (1, 2, 4, 4a, 6) and isthmuses, constrictions 3, 5, 7a), are visible, though the entire ureteral dilatation is extensive. The vesical orifice of the distal ureter is located in the trigone proximalward and lateralward to that of the proximal ureter. The ureters cross each other in the lesser pelvis. Sketched from a specimen in the pathologic museum of Rush Medical College through the courtesy of Prof. Le Count.

These data make the vesical orifices of the duplicate ureters an important guide as to the proximal or distal pole of the

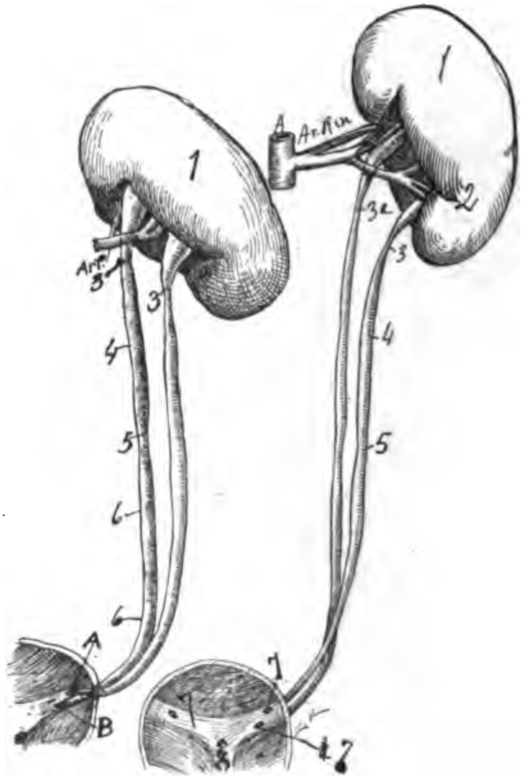

Fig. 5.

Two complete duplicate unilateral ureters from adults. The Figure to the right shows the ureteral crossing occurs at about the level of the pelvic brim. · The figure to left presents ureteral crossing occurring closely adjacent to the wall of the vesica urinaria. In both specimens the vesical orifice of the proximal ureter (B and 7a) has its exit distalward and medianward to that of the distal ureter (7 and A). The figure on the right preserves the rule that the ureteral dilatations and isthmuses are relatively less in dimensions in complete duplicate ureters. In the figure on the left the ureteral dilatations and isthmuses present acquired dilatation, however, especially in the ureteral dilatations. The arteria renalis presents no abnormal conditions in either specimen 3, proximal isthmus; 4, lumbar spindle; 5, middle isthmus; 6, pelvic spindle; 7 and A, vesical orifice (distal isthmus) of distal ureter; B and 7, vesical orifice, (distal isthmus) of proximal ureter. The proximal ureters are the longer. The distal pelves are almost always the larger. I had the illustrations drawn from specimens in Rush Medical Museum, by the courtesy of Prof. Le Count.

kidney. In complete duplicate ureters the proximal ureter is the longer.

Vesical Orifices in Duplicate Ureters.—In the vesical inspection of duplicate ureteral orifices it must be borne in mind

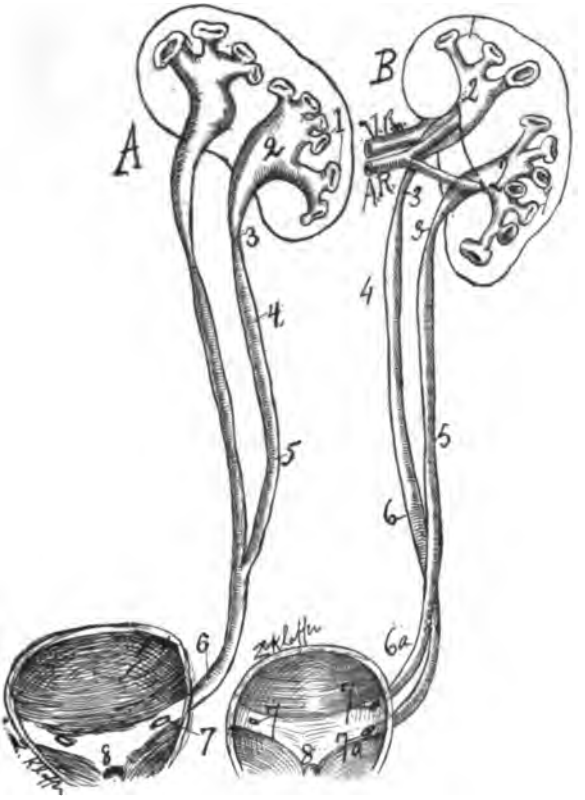

Fig. 6.

The illustration on the right (B) represents a complete unilateral duplicate ureter, presented to me by the courtesy of Dr. Fanyo. The ureteral crossing occurred at about the level of the bony pelvic brim. The proximal ureter crossed dorsal to the distal ureter. The vesical orifice of the proximal ureter (7a) has its exit distalward and medianward to that of the distal ureter (7). The proximal ureter is the longer. The distal ureteral pelvis is the larger. The figure on the left (A) is a partially duplicate ureter. The ureteral dilatations, spindle reservoirs (1, 2, 4 and 6), and ureteral constrictions, isthmuses (3, 5, 7, 7a) are normal. In figure on the left (A) a ureteral calculus might enter in one branch of the ureter and allow the ureteral catheter to pass through the other. The same might be said of specimen on the right (B). The figure on the left (A) is drawn from a specimen in Rush College Museum, through the courtesy of Prof. Le Count.

that the proximalward and lateralward ureteral orifice located in the lateral trigonal angle leads to the distal ureter or distal renal pole, that the distalward and medianward ureteral ori-

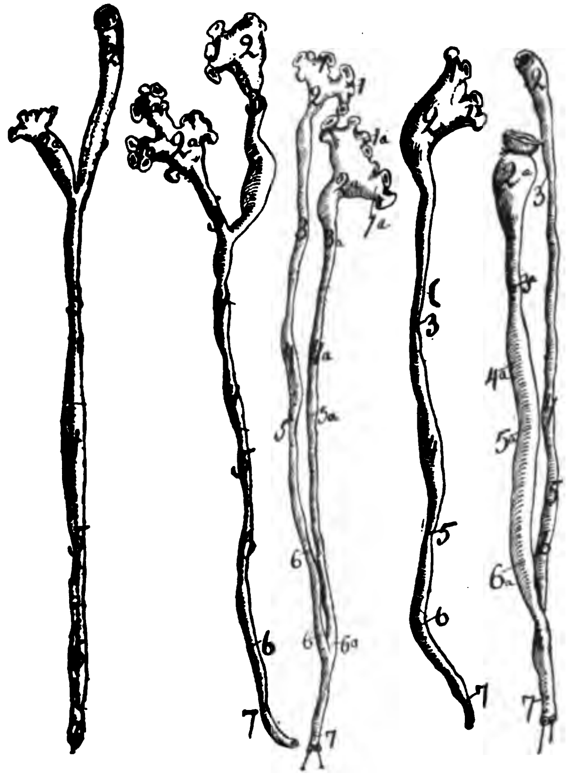

FIG. 7.

Paraffin casts present two unilaterally complete duplicate ureters from different subjects. The one on the extreme right presents a ureteral crossing about two inches from the bladder. The two pins display the vesical orifices. The proximal ureter is the longer, and crosses dorsal to the distal ureter. The distal vesical orifice of the proximal ureter has its exit distalward and medianward to that of the distal ureter. The distal ureter presents unusual dilatation. The ureteral dilatations (2, 4, 6) are marked, as well as the ureteral constructions (3, 5, 7). The third ureter from the rigght side is also a complete unilateral duplicate, the description of which is similar to the complete duplicate ureter on the extreme right as regards crossing, location of vesical orifice and length. The first two ureters on the left are from the same subject. The second and third ureters from the right are also from the same subject. It may be noted that the duplicate ureters in this cut terminate as if the two tunicæ mucosæ were included in one common tunica mucularis and tunica fibrosa. The first and second ureters from the left are partially duplicate.

fice of the trigone leads to the proximal ureter or proximal renal pole. However, occasionally the ureteral vesical orifices are so closely adjacent that they can not be located as to trigonal landmarks. In general in ureteral duplicity the distal

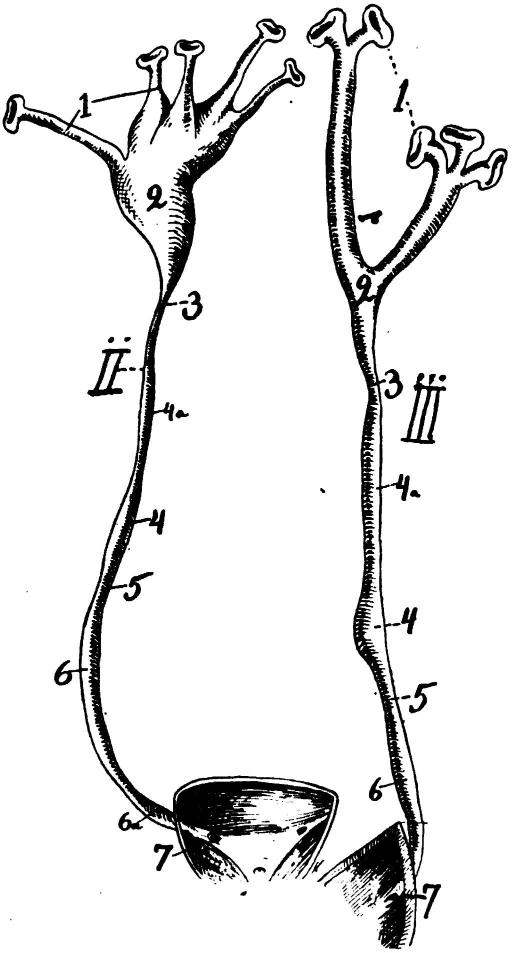

FIG. 8.

Paraffin casts. Ureter number iii on the right partially duplicate, almost to the proximal isthmuses (3). It has a marked dilatation at 4, which was located immediately proximal to the common iliac artery. Ureter number ii represents a whirl of elongated calyces. The ureteral constructions, isthmuses (3, 5, 7) and ureteral dilatations, reservoirs (1, 2, 4, 6) are normally located and evident ureter terminates lateralward and proximinalward in the trigone. In general the proximal ureter terminates distalward and medianward in the trigone. The vesical ureteral orifices in duplicate ureters are smaller, rounder, more ill-shaped than normal ones.

In none of my 10 cases of complete duplicate ureter was any vesical ureteral orifice located external to the trigone.

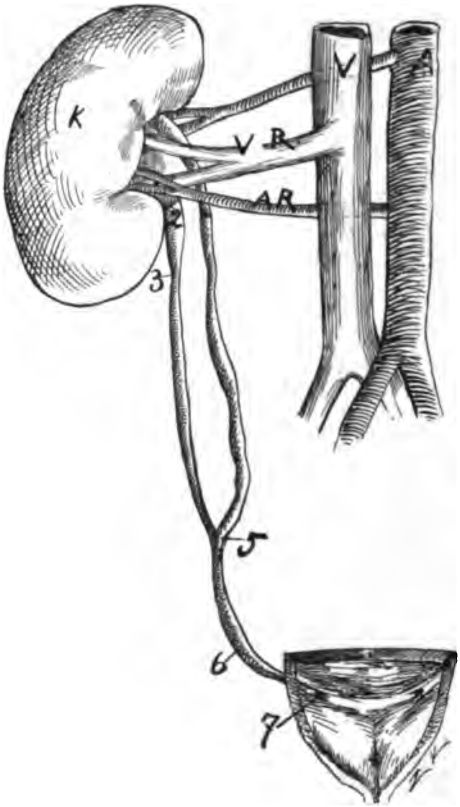

FIG. 9.

Partially duplicate right ureter of a child with multiple renal arteries; ureteral catheterization in this case would be uncertain; ureteral isthmuses (3, 5, 7) and ureteral dilatations (2, 4, 6) are located normally and of usual dimensions. This specimen was presented to me by the courtesy of Dr. Horace J. Whitacre, of Cincinnati.

Vesical inspection in partially duplicate ureters so far has presented no utility. With complete duplicate ureters segregation of urine is defective unless both ureters of one side are catheterized. The vesical orifice of the duplicate ureters were from one-twelfth of an inch to one-eighth of an inch separated.

Ureteral Catheterization in Duplicate Ureters.—The modern cystoscope with its excellent electric lighting power enables the ureteral orifices to be located and catheterized. If duplicate ureteral orifices be discovered catheters with metal wire in their lumen may be introduced and X-rayed in situ, the shadow of which will demonstrate the location and destiny of the catheters. The proximal ureter being the longer will

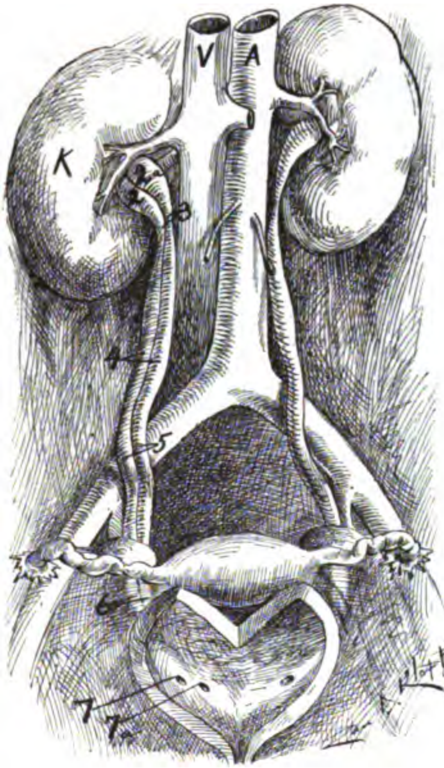

FIG. 10.

Right unilateral duplicity of an adult female. On account of the dissection of the specimen it was not absolutely certain whether the ureters crossed each other, but it was the belief that they crossed in the lesser pelvis. Ureteral isthmuses (3, 5, 7) and ureteral dilatations (2, 4, 6) are normally located and marked.

aid in determining which pole of the kidney is catheterized. The location of the vesical orifice in duplicate ureters will also aid in distinguishing the proximal from the distal ureter. The malformation frequently existing in duplicate ureteral orifices occasions difficulty in catheterization. The introduced catheters will determine the separate functional capacity and contents of each kidney segment attached to its respective ureter.

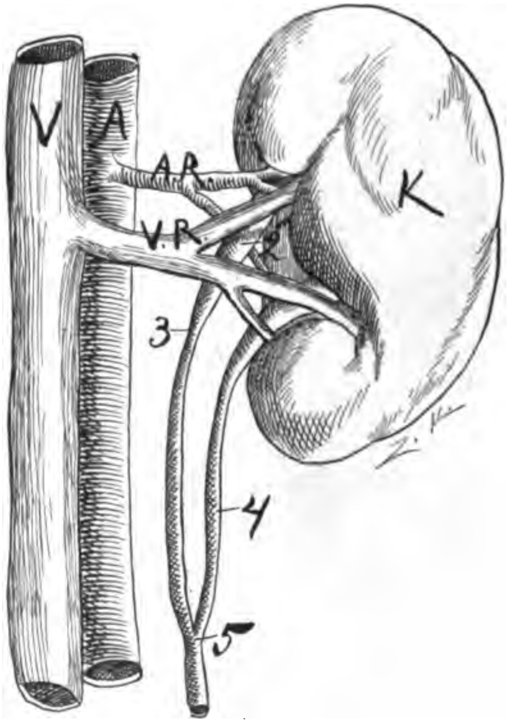

FIG. 11

Left partially duplicate ureter of of child. The specimen was presented to me by Dr. Horace J. Whitacre, of Cincinnati.

Ureteral catheterization in partially duplicate ureters is uncertain. If by manipulation the catheter could be introduced in each branch of the partially duplicate ureter some knowledge might be obtained from the different composition of the urine or by X-raying the catheter in situ it would demonstrate the location of the proximal end. In partially duplicate ureter if a catheter be passed to the pelvis of one branch it would conduct the urine of that pelvis while if the pelvis were separated the urine of the other pelvis would flow along the catheter which would give a clue to two pelves or partially duplicate ureter. If the ureteral pelves were not distinctly separate no clue would be presented of partially duplicate ureter.

The Pelvis and Calyces in Duplicate Ureters.—All complete duplicate ureters, so far dissected, possess distinctly separate calyces and pelves. Also the calyces and pelves are almost always separated by a renal wedge of renal tissue.

This wedge of fibro-renal tissue is no doubt amply sufficient anatomic ground for the surgeon to divide safely the proximal calyces (and their parenchyma) from the distal calyces (and their parenchyma) in cases where disease indicates the removal of part of the combined organ. The specimens demonstrate that one ureter and its corresponding renal parenchyma may become diseased while the other ureter and corresponding renal parenchyma may remain healthy (see Fig. 4).

In partially duplicate ureters the pelves and calyces are not always separated—uncertain. The calyces and pelves of duplicate ureters are relatively smaller than normal, uncertain in dimensions, number and form. In general the distal calyces and pelves of duplicate ureters are the larger, demonstrating their greater functional capacity.

The Lumen of Duplicate Ureter.—In complete duplicate ureters the caliber of the ureter (as well as the vesical orifice) is relatively smaller than in single ureters. This is an important fact as the limited lumen of duplicate ureter is frequently disposed to be obstructed by calculus. The lumen in partially duplicate ureter is uncertain, however, it approaches that of normal ones. In complete duplicate ureters one of the ureters is liable to have a distal blind or coecal termination (see Fig. 4).

Ureteral Isthmuses and Dilatations in Duplicate Ureters.—The ureteral isthmuses (contractions) and dilatations (reservoirs) are relatively smaller than that of single ureter. The important anatomic factor lies in the 3 constricted ureteral isthmuses as it predisposes to the obstruction of the ureter by calculus especially at the proximal and distal ureteral isthmuses. Multiple isthmuses and dilatations may arise in complete ureteral duplicity (see Fig. 1).

The ureteral isthmuses and constructions of partially duplicate ureter differ but slightly from normal, however, they may present uncertain forms, dimensions and locations.

The Course of Duplicate Ureters.—The duplicate ureters assume practically the same course as single ureters. The duplicate ureters generally course closely adjacent, parallel to each other (see Figures 1, 4, 10).

The proximal ureteral segments are generally more separate from each other than the distal ureteral segment. The distal or portion in the lesser pelvis of duplicate ureters may be so closely applied to each other that the tunica fibrosa and perhaps some of the tunica muscularis may be absent as in Figure 7, when the two pins demonstrate the two ducts of mucosa apparently closely applied to each other. The partially duplicate ureter may bifurcate at any point from kidney to bladder, however, the division generally occurs at a point between the kidney and pelvic brim.

In my 9 cases of complete ureteral duplicity 6 were on the left side and 3 on the right side. In my 11 cases of partial ureteral duplicity 6 were located on the right side and 5 on the left.

TERAL DUPLICITY

SOCIETY PROCEEDINGS

HILADELPHIA PEDIATRIC SOCIETY

Meeting, Tuesday Evening, May 10, 1904.

ident, DR. J. H. JOPSON, in the Chair.

OF INFANTS.—Dr. Rowland G. Freeman,
ation, addressed the Society on the Care
n after the First Year.
Dr. Edwin E. Graham said that he had
reeman had recommended pasteurizing the
y the child during the second year. It has been
ham's custom to stop pasteurizing the milk at the end
the first year, when the milk-supply is thoroughly reliable; and to continue pasteurizing subsequently only during the hot summer months. It has also been his habit not to increase the diet during the summer, unless the child is in a cool climate or is at least two years of age.

He stated that in convalescence from acute diseases he had frequently obtained excellent results from rectal alimentation, which relieves the stomach from strain at a period during which it is extremely susceptible to strain. It must be remembered that the rectum absorbs, but does not digest. Albumoses are readily absorbed; also peptones, if well diluted. Foods should be more or less peptonized before being used as a nutrient enema.

Dr. Graham has likewise had very satisfactory results from massage, particularly in constipation; and he considers that, as a rule, massage is not sufficiently appreciated by pediatrists. He has found it valuable in many conditions, such as inanition and chronic gastrointestinal disease; and when there is unequal development of the limbs of the two sides. Massage increases vigor, induces appetite and sleep, strengthens the circulation, and raises the temperature of the part manipulated. The contractile power of the muscles to electricity is also increased; the circulation in the lymphatics is improved; and the nervous irritability is lessened. Massage is especially beneficial for delicate children, and the tedious convalescence of such children is often distinctly hastened by daily massage.

Dr. Graham also referred to the important function that the physician may, at the present time, assume in the moral and mental training of the child, especially in relation to the literature furnished it; condemning the custom so generally prevalent, even in the better classes, of supplying young children with cheap literature gaudily illustrated.

ERRORS IN EARLY TRAINING.—Dr. J. P. Crozer Griffith said that Dr. Freeman's views correspond quite closely with his own. In feeding children, after the first year, there are two great errors. The first is fool-hardiness in overfeeding; and the second, the direct contrary, is over-caution. The first is met with most frequently in the lower and middle classes, but is also common in the upper. The chief fault is in giving too much starchy food. Excessive caution is less common, but is not infrequent; the parents being afraid to take the child off a diet that has once been prescribed and found to agree with it. The consequence is that the child gets too little food, and does not grow properly.

French writers have insisted a great deal upon the importance of preventing the development of the gouty diathesis by excluding from the diet meats, etc.; but Dr. Griffith considers this course more theoretical than practical, and is inclined to give more meat than Dr. Freeman recommends. Dr. Griffith admitted, however, that individualization in regard to this point is very important. In general it has been his experience that flatulent dyspepsia, due to an excess of starches in the food, is of great frequency in children over two years of age. He agrees with Dr. Freeman that eggs are usually given too early, and thinks that they should not be used before the fifteenth month. He has grown more cautious about using potatoes, since finding that they often disagree; and he does not allow them before the eighteenth month.

Dr. Thompson S. Westcott said that he was very glad to note the conservatism of Dr. Freeman, especially in the dietary of the second year; and that he entirely agreed with Dr. Freeman. As Dr. Griffith had remarked, great caution is necessary in the use of potatoes all through the second year. His experience had also convinced him that it is irrational to give a baby whole milk merely because it has reached the age of twelve months. Most of his patients that have required careful feeding during the first year have not been able to digest whole milk until the age of fourteen or fifteen months. After all, whole milk should be regarded as the final modification in a series of formulæ that are to be prescribed progressively, in accordance with the child's digestive capacities. It has often been Dr. Westcott's experience that some slight dilution has been necessary until well toward the end of the second year, and that some children can never acquire the ability to digest undiluted milk. He believes that in some cases this depends upon an inability to assimilate so much fat as four per cent.

In these cases, he has found partial skimming of the milk to be of decided value. Such children usually have a history of serious difficulty during the first year in digesting ordinary modifications, in which the mistake of forcing fat-percentages too high is frequently made. This is undoubtedly the case in many instances in which milk is thought to disagree, and is therefore discarded altogether; whereas a judicious modification of the fat-percentage would have promptly remedied the difficulty.

Dr. D. J. Milton Miller thought that feeding during the second year is, on the whole, more difficult than during the first. The chief trouble is in the tendency of parents to use too much farinaceous food, especially potatoes and oat-meal. These foods have become a great enemy to both the child and the adult, on account of the enormous variety of breakfast foods that have been foisted upon the public. Of these, very few are suitable for children, principally because they are not cooked sufficiently. The chief suitable ones are hominy-grits, oat-meal, and cracked wheat. All these should be thoroughly cooked.

Dr. Miller considers it advantageous to dispense with the nine or ten o'clock night feeding as soon as possible after the first year. He has found that constipation is often quickly relieved by diluting the milk a little, particularly with gruel. He referred to the frequent refusal of children to take any considerable variety or quantity of food during the second year, and to the difficulty in overcoming this. The great danger among the better classes is, however, as Dr. Griffith had remarked, that the parents err on the other side and limit the child's diet too strictly. In children with a tuberculous ancestry especially, it is important to allow a fairly free diet and to encourage the child to eat a good deal. Dr. Miller believes that after the third year all children should be allowed to eat any kind of wholesome food, unless there is some particular contraindication.

FULL MILK AND ITS INDICATION.—Dr. Walter Lester Carr, of New York City, said that he has been accustomed to using full milk after the first year; although, in certain individual cases, he has found it advisable to modify the milk slightly. His experience, also, has been that parents tend to overdo the use of cereals; and that they are especially likely too cook these too little, chiefly owing to the statements contained in the advertisements of these cereals. He referred to the frequent use of rice-pudding as a dessert, and stated that he had often found it to disagree with children. He noted that Dr. Freeman had recommended giving orange-juice at a meal that includes milk. Dr. Carr considers this disadvantageous, as he thinks orange-juice likely to upset the stomach, when given with milk. He is accustomed to giving it in the interval between two meals, usually allowing crackers or bread with it. He agrees with Dr. Freeman in considering beef-juice an unsatisfactory portion of the diet. The effect that he has observed from it is the same as that produced by small doses of alcohol. He considers scraped beef much better. His custom is to omit the nine o'clock P.M. feeding after the fifteenth or the sixteenth month, but he usually continues it up to this time. He has had much more experience with overfeeding than with underfeeding, and has often found that children whose digestions are out of order do better when he takes out a feeding or two.

Dr. S. McC. Hamill agreed with Dr. Freeman in nearly all his views. He had noted, however, that Dr. Freeman condemned prunes and apple-sauce. He asked upon what evidence this opinion was based. Personally, he used both after the second year, with, he thought, great advantage. Dr. Freeman had recommended the use of the bicycle. Dr. Hamill considered bicycling an objectionable form of exercise unless carefully controlled. He thought it particularly important to have children use exercise that develop the arms and the upper portion of the trunk, rather than the legs; such development is frequently neglected, whilst the legs take care of themselves. He believed that, as a rule, pediatrists are not sufficiently careful and explicit in regard to the question of fresh air, particularly the admitting of fresh air into bed rooms. Among the poor, especially, where it is almost impossible for them to afford sufficient covering, the admission of fresh air is more difficult to accomplish. Many of the diseases among this class are chiefly the result of neglect in attending to this point.

FATTY INDIGESTIONS.—Dr. D. L. Edsall said that, while he fully agrees that the usual error in feeding young children is in the excessive use of carbohydrates, he is convinced that too little thought has been given to the possibility that disturbances of digestion and of the general health may be due to the excessive use of fats, or to the inability of the child to digest fat properly. He has repeatedly found that children with gastrointestinal fermentation, and with languor, lack of energy, and other indefinite disturbances in health, have done very well when the amount of fat has been limited or the character of the fats used has been carefully regulated. In a series of these cases he has made some observations of the urine and feces, noting a great deal of fermentation in the latter; and the presence of large amounts of indican, phenol, volatile fatty acids, etc., in the urine. All the abnormalities disappeared after practically no treatment except restriction of the fats. Dr. Edsall especially noted that these disturbances are likely to occur in children who are rather thin and look ill-nourished, and who often have been put by their physicians on a fairly free fat-diet for the purpose of attempting to increase their weight. He also noted a number of cases in which, together with an appearance of poor nutrition and rather indefinite ill-health, there had been a most offensive odor to the breath; one child in particular having been practically ostracised from his family on account of his offensive breath. This patient had been treated by nose- and throat-specialists, and by various other doctors; and it had been repeatedly recommended that he take more fats to improve his general health. The exclusion of butter and cream, together with skimming the milk and largely excluding other fats, overcame this condition, and the child's general health improved greatly. Dr. Edsall believes that the butter-fats, as found in butter, cream, and milk, are those that cause the greatest amount of trouble in most cases, chiefly on account of their tendency to contain a large amount of the lower fatty acids.

WATER AND TEMPERATURE.—Dr. W. D. Robinson asked Dr. Freeman to mention the regulations adopted by him in regard to the temperature of the water given the child to drink, and the amount of water he allows it to have. In the treatment of constipation, Dr. Robinson has found that the heavy petroleum-oils act as excellent lubricators and are not absorbed, being eliminated unchanged. In constipation, he usually administers ordinary white vaseline with a little water or orange-juice, with excellent results. He has had much success with this treatment in disease, as well as in health; particularly in the severe constipation that often accompanies typhoid fever. He thinks that it restricts bacterial growth, largely because it forms an oily coating over the contents of the entire digestive tract. He has also found that an antiseptic may be carried all the way through the digestive canal, when given in heavy petroleum-oils, such as vaselin. He has administered salol in this way, dissolving it in vaselin by means of heat; and, on testing the stools, has found that the salol had been carried through the digestive tract. He thinks that at times this treatment has constituted a valuable means of controlling intestinal fermentation.

Dr. Hamill said that he had often found that to eliminate bread from the diet does much good, when the elimination of cereals does not. He thinks it possible that, the coincident elimination of the butter which is used on the bread, may have contributed as much to the improvement as the exclusion of bread.

Dr. E. Rosenthal asked Dr. Freeman what can be done in regard to the use of sugar, when dealing with the class of persons that give children sugar with all forms of food.

Dr. W. G. Elmer considers it of some importance for physicians, when allowing persons to go away for several months, to be careful to plan the child's diet during this time, or to put the child under the care of another doctor. In several instances, there have come under his care children that had been allowed to continue for a number of weeks or months upon modified milk and bottle-feeding, which had become entirely inadequate for the child's growth and development; and the nutrition and general health of the child had suffered seriously in consequence. This was due to the fact that the mother had been sent away for a period of several months with the advice that no change be made in the feeding of the child until her return.

PASTEURIZATION OF MILK.—Dr. Freeman, in closing, said that while he had put the nine P.M. feeding on the list for the whole of the second year, he had not meant this to be an absolute regulation; as he thought that this feeding could often be eliminated during the early part of the second year with advantage, just as the ten P.M. feeding may often be excluded with advantage in the third year. As to pasteurizing, he regularly does this as long as the child takes as much as a quart of milk a day. When the child is on a reliable milk, he does this on account of fear of gastrointestinal infection, as well as on account of the possible danger of conveying infections such as typhoid fever, scarlet fever, and diphtheria through the milk. He agreed with Dr. Graham that it is often wise not to increase a child's diet at all during the summer, and that it is frequently better even to cut the diet down somewhat. As to the use of prunes and apple-sauce, he has found that they often cause disturbance of digestion; and he believes that they have no noteworthy nutritive value. Orange-juice is much more digestible and more reliable.

Dr. Freeman agreed that too much fat is often given, and that this matter needs to be carefully watched. As to water, he had mentioned in his paper that this should be given between each feeding, and that the child should be allowed as much as he will take. The most common difficulty is to get children to take enough water, rather than the contrary. In regard to sugar, Dr. Freeman is accustomed to tell these parents that wish to use more sugar, that milk contains four or five per cent. of sugar, and that this amount is quite sufficient for any child. The danger is that if the parents begin to use sugar, they will give too much; as children always want more. The safest and easiest way is to give none.

EDITORIAL

MEASLES AND PROGNOSIS

While to the average layman measles as a disease of children is regarded in the light of a mild visitation, to the physician of extensive practice it presents a number of problems, the solution of which is attended with considerable anxiety.

The immediate diagnosis is one factor that is fortunately not fraught with much difficulty, but the probable advent of complications, and the comparative severity of their symptoms brings into the foreground a number of intricate questions bearing both on the immediate and on the remote prognosis.

It is known that epidemics of measles vary very widely in their symptoms and that whereas they are frequently mild in their general characters but that often, for the poorer classes in the crowded cities at least, they become very dangerous.

In the light of comparison have we any criteria by which the severity of an epidemic can be foretold, and if so what precautions can preventive medicine devise to mitigate in some manner the extreme severity of the devastating complications and to lower the heavy mortality by leading to earlier and more careful treatment?

Dr. Harold Balme, Resident Medical Officer, London Medical Mission, has recently made (*Practitioner*, Oct., 1904) a special inquiry along lines of this general trend and has brought out some facts that seem of value in this connection.

In the study of the disease in the London slums he finds that the incubation period varies from 6-18 days, and that it has been his experience that in those instances in which the incubation period has been a short one that the severity of the disease is apt to be more marked. Over forty per cent. of 227 cases had the disease very severely between the ags of 12 months and 2 years, this age period showing to be the one most to be feared with reference to the severity of the attack. In children under 6 months measles was a very mild affair.

In a study of the prodromal symptoms he considers vomiting, diarrhea, nose-bleed, laryngitis, cerebral symptoms and Koplik's spots.

Vomiting occurred in over 65 per cent. of the observations, coming on at the onset, with the appearance of the rash, or as an intermediate symptom. Vomiting which occurs in the intermediate period he believes to have a more severe prognostic significance than at any other period in the affection. Diarrhea was present in 28 per cent. and when associated with abdominal pains is to be considered as indicative of a more severe type of the disease.

Epistaxis, in the absence of nose lesions, is to be looked upon as a grave constitutional sign and most of his patients having this symptom were very ill. A prodromal laryngitis is another sign indicating a more serious outcome in the disease.

Koplik's spots were positive in almost 98 per cent. of his patients. They therefore were considered by him as of great diagnostic aid. He further adds some important descriptions which are of interest leading to their better identification. They are also of some value in prognosis, being very plentiful in the more severe cases and absent or very difficult to find in the attacks of minor severity. Cerebral symptoms nearly always mean a more severe attack of the disease, and hyperpyrexia is often a fatal concomitant of these cerebral cases.

Speaking of the complications he adds little to our knowledge of the disease. Those complications such as capillary bronchitis, bronchopneumonia, etc., occurred in about the number of cases that other observers have recorded, and their seriousness in the way of prognosis is well recognized.

This little study, while not exhaustive, is suggestive and emphasizes the fact that if measles is treated as a more serious affection the mortality is liable to be less, and the more serious complications are less liable to arise. Moreover, if care be taken in the convalescence the dreaded chronic pulmonary and nephritic conditions leading to break down in early adolescence are much less apt to occur.

ADOLESCENCE

Up to within the past decade, in this country at least, the adolescent child like Topsy has just "growed."

Pediatrists have followed closely on the obstetrician in their care of children, but after getting them on solid food, as it were, "they have been neglected, i.e., from the scientific point of view, by the physician.

The pedagog in his own way has formulated his doctrines, but these formulæ have so often concerned the development of the cerebral substances, that the child as a biological unit has unfortunately been neglected.

We welcome the advent of a new and almost inspired movement that has now become embodied in the teachings of Stanley Hall in his recent monumental work on *Adolescence*.[1] We venture to assert, in passing, that no such grasp of the adolescent period has ever been shown by other students, and that whereas many minor defects may be encountered in his system, the value of the work as a whole to teachers, parents, law-givers and physicians will be far reaching and fundamental.

In Chapter IV Dr. Hall very truly remarks that until recent years there "has been a remarkable gap in the medical literature and knowledge concerning health and disease during adolescence." Pediatrics usually leaves the child after the cutting of the teeth at the ages of from 8-10, "and one finds little attention paid to even the early stages of puberty." "A striking illustration of this relative neglect and ignorance by the profession of the morbific peculiarities of pubescent life is seen in the fact that until well within the last decade, writers often inferred morbidity from mortality tables and many were thus strangely misled, because early adolescence, while the most healthful period of life, if measured by death rates, which are then lowest, is most prone to many ailments, and is therefore marked by a high percentage of ill health."

This every physician realizes and as Dr. Hall has said our work is so crowded with actual severe illness among all classes, we have not paid as much attention as we might to preventive medicine, hygiene, and regimen, both public and private.

Fortunately neither the pediatrist nor general practitioner deserves in its entirety, if even in part, the criticisms of the gifted author of this brilliant work, for it might be interpolated that the physician is a daily worker with the people, and makes up in his ceaseless round of admonitions, and directions, for his lack in literary expression. Hall has fallen into the common error of supposing that because the physician has not spent his hours in scribbling about adolescent conditions that he has been unmindful of the many morbid agencies at work. The common soldier in the army, for such most of us are, must be content to be overlooked, sometimes even by the discriminating.

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[1] D. Appleton & Co., 1904.

But apart from the personal pride that we as pediatrists take in the daily work of our profession, we feel that much can be taken more closely to heart from the teachings of this book. The criticisms are only incidental, they are a form of literary expression, a symptom of adolescence itself, the great conclusions of the many studies which have been brought together for the first time should be read by every physician who has to do with the treatment of patients, and we take occasion in this place to call the attention of our readers to one of the epoch making books of recent years.

ABSTRACTS

Myositis Ossificans Progressiva.—COMBY AND DAVEL (Archives de Médecine des Enfants, July, 1904); KRUSCHE, A. (Jahrb. für Kind., June 1, 1904); FERRATON (Revue d'orthopédie, July 1, 1903). The case reported by Comby and Davel was originally described by Manard in 1902. Since then two and a half years have elapsed, enabling the writers to note the progress made of this singular affection. The disease began at the age of five months, and progressed slowly but without cessation. The father of the child was a vigorous man and the mother was healthy. The child was born at term and was breast-fed. At the age of six months, following an attack of measles, it showed the first manifestations of the disease. There was an enlargement in the region of the mastoid which led to a diagnosis of a cervical Pott's disease. From that time on the trunk became less mobile. At the present time the patient is eight years of age, of medium height, and markedly emaciated. Upon observing the body with the clothing removed the depressions of the subclavicular regions are less marked. Apparently the pectoral muscles are atrophied, but they are of firm consistence, and upon palpation it is noted that there are cartilaginous masses in the body of the muscle. The same cartilaginous masses are found in the trapezius and muscles of the back, which effectually immobilize the vertebral column. An osseous splint is found along the inner border of the biceps, which is readily seen in a radiograph accompanying the article. The triceps and the deltoid seem to be nearly intact. Flexion and extension of the forearms is limited. The lower extremities are intact.

The case described by Krusche occurred in a girl of 2½ years who had until recently been well, but is now unable to raise the right hand. She was pale and feeble. Above the shoulder-blade was a hard, painful tumor extending downward along the vertebral column. At the end of three weeks the tumor had softened, permitting a certain amount of movement in the shoulder-blade. Then a second tumor developed near the crest of the ilium, extending along the dorsal muscles including the trapezius and the rhomboid, uniting the lower portion of the shoulder-blade with the inferior portion of the thorax. Associated with this was an induration of the muscles of the neck.

Ferraton describes the case of a man 18 years of age who entered the hospital for the relief of restricted movements of the jaws. There was substantially the same history as in the previous cases, excepting that the tumefaction developed in the muscles of mastication especially, though other muscles were invaded, so that at the time he was seen the face was immobile and but limited movements of the trunk were possible.

A Simple Method of Modifying Milk in Tenements.—Coolidge, E. L. (Archives of Pediatrics, August, 1904). Modifying milk for tenement house babies in their own homes, where even a quart measure and a tin funnel are often unheard-of luxuries, and where the mother is so ignorant that she has no idea of an "ounce," is a very different proposition from feeding these same babies in a modern hospital with a well-equipped diet kitchen and trained nurses. In many instances the feeding is accomplished quite as readily as in an institution, when the mother can once be made to understand and follow the directions. Nearly 200 cases have been treated belonging to the out-department of the Babies' and Lying-in Hospitals, with on the whole satisfactory results. In the management of these cases the mother is first given an object-lesson in the preparation of the food and care of the bottles. The milk is then modified, and the quantity for twenty-four hours pasteurized in certain cases while she watches the entire process. This is most important, as directions alone to the mother ony lead to absurd mistakes and an imperfect application of the method. After the first object-lesson printed directions are left, and two or three calls are made during the first week or two to see how she carries out the plan, and also to judge how the child is thriving. Only four per cent. plain milk mixtures are used, and in nearly every case a cereal is taken as the diluent; sometimes digested gruels are used, but generally not. It has been repeatedly demonstrated in the out-patient department of these hospitals that moderately high fat or cream mixtures, which are so important in the well-to-do, have not the same results among the poorer classes, who do better on plain milk mixtures, where the ratio between fats and proteids is more nearly equal.

A Fatal Case of Diphtheria of the Conjunctiva.—Stephenson, S. (The Ophthalmoscope, August, 1904). The case described is that of a baby 11 months old which was wasted and had evidently been neglected. She was brought to the hospital because of inflammation of the eyes. The conjunctivæ were red and discharging abundant mucus. Five days later the eyelids were so much distended that they were drawn apart with difficulty, discharging a thin, watery pus. The lids were cleansed, and protargol, 50-per cent. solution, was applied directly to the conjunctiva of the eyelids. On the following day it was noted that there was some bleeding when the membrane was removed. Two days later the child was admitted to the hospital, and at that time its pulse was feeble and the respiration slow. The palpebral conjunctiva was covered with an ashen-gray membrane. A diagnosis was then made of diphtheria of the conjunctiva. Antitoxin was used, but the patient died of collapse eight days after the commencement of the conjunctival inflammation. A bacteriological examination showed the Klebs-Loeffler bacillus. The writer states that diphtheria of the conjunctiva is far from rare in London. Of 3,412 eye patients seen at two hospitals for children there were 43 instances of the disease. Nearly two-thirds of the cases were met with in children under three years of age. The cases were most frequent during the spring.

Status Lymphaticus.—BIECHELE, R. A. (Archives of Pediatrics, No. 7, p. 500, July, 1904). Attention is called to the imperfection of our knowledge of the pathology of this condition. To define it as a hyperplasia of the lymphatic system and of the thymus gland in particular serves only to obscure the indistinct line of demarcation separating the simple hyperplasia of the lymphatic structures from that which is associated with a constant or intermittent lymphotoxemia. Of the numerous morbid findings none is more constant than that of the enlarged thymus gland, and in exceptional cases this may be the only manifestation of morbidity. Unless the gland is altered by cystic degeneration its macroscopic appearance is similar to a normal gland, with the exception of the enlargement. Upon microscopic examination the only observable feature is a degeneration of the corpuscles of Hassall. The weight varies from a little above normal to 140 to 150 grammes. The normal weight of the gland is about 19 grammes. Associated wth the enlarged thymus there is a general hyperplasia involving all of the lymphatic structures. In one of the cases reported by the writer Peyer's patches in the intestine were prominent. Microscopically the lymphoid elements showed extensive hyperplasia. The spleen is usually enlarged, but its consistence is about normal. It was formerly supposed that pressure between the sternum and the spinal column was the cause of death. Experimental and other evidence throws doubt upon this theory, though its does not wholly exclude it as a cause of the fatal termination in exceptional cases. The most generally accepted theory at the present time is that it is a lympho-toxemia which leads to certain nervous phenomena and may cause death from cardiac paralysis. A case is reported of what was undoubtedly status lymphaticus, though a post-mortem examination was not made. The patient was 11 months old, and fell from a child's stool, striking the side of her face upon the floor. Convulsions supervened at once, but ceased at the end of two hours. Then thymic asthma developed and continued for about three hours. This was followed by a short period of coma. Again there were convulsions, which continued until death, which occurred twenty-two hours after the receipt of an injury so slight that under ordinary circumstances it would pass unnoticed. When six months of age this child had an attack of enterocolitis, during the course of which she had an attack of thymic asthma and several slight convulsive seizures. Rickets was well marked. There was dulness over the region of the thymus, the tonsils were large, adenoids prominent, superficial lymph nodes not much enlarged.

The case illustrates the importance of thymic asthma and convulsive seizures in the diagnosis of this condition. The rickets is usually coincident but not constant.

Status lymphaticus is closely related to infection. Subjects with lymphatic tendencies acquire infections readily, and are especially liable to complications during their progress. Two cases of this kind are reported of influenza infection in infants who died in convulsions. Post-mortem examination showed hyperplasia of the lymphoid elements and degeneration of Hassall's corpuscles.

Infantile Inguinal Hernia of the Vermiform Appendix, with Adhesion to the Epididymis.—Stanton, MacD., and Shaw, H. L. K. (Albany Medical Annals, August, 1904). The position of the testicle and the appendix high in the abdominal cavity in fetal life makes it possible for them to become adherent, and the descent of the testicle will carry with it the appendix. It is believed that this explanation accounts for the case observed by the writers. The early inflammation involved both testicles, together with their peritoneal covering. Adhesions formed between the distal end of the appendix and the tunica albuginea overlying the head of the right epididymis. The patient, an infant, was admitted to the Albany Orphan Asylum when a little more than two months old, and remained in that institution for nearly a year, during which there were no symptoms referable to the appendix or genital organs. The patient died of bronchopneumonia following measles. At autopsy the appendix was found to have a length of eight centimeters, and to extend directly downward, with a free meso-appendix extending from the cæcum through the internal ring and inguinal canal. The union between the testicle was so firm that the latter could be drawn up into the inguinal canal by traction on the appendix. When the testicle was in a normal position there was a slight evagination of the peritoneum around the appendix at the right of the internal ring. Otherwise the funicular process was completely obliterated, and there was no evidence of a hernial sac. On dissecting out the appendix, it was found that the portion lying within the canal was covered with loose areolar tissue, while a thick band of firm fibrous tissue united the tip of the appendix to the tunica albuginea.

Antidiphtheritic Serum in Diphtheritic Paralysis.—Comby, J. (Archives de Médecine des Enfants, tome 7, July, 1904). A number of cases of late accidents of diphtheria have been reported as cured or greatly ameliorated by the injection of antidiphtheritic serum. Morquio (Rev. Méd. del Uruguay, 1900) cured a case of diphtheritic paralysis in a boy of four years by injections of serum. Mongour (Journ. de Méd. de Bordeaux, August, 1900) treated two infants affected with diphtheritic paralysis by the serum. One of the most striking cases is that cited by Ginestous (Gaz. hebd. des Sciences Méd. de Bordeaux, October, 1902), a girl of five years, who had had diphtheria two years before, followed by paralysis of accommodation and convergence since that time. Complete recovery was obtained after two injections of serum. Soulé published (Gaz. hebd. des Sciences Méd. de Bordeaux, May, 1903) the case of an infant of five years who suffered from grave paralysis one month after an attack of diphtheria. There was paralysis of the soft palate, loss of voice, strabismus, weakness, and difficulty in walking. For five days the symptoms increased, when an injection of 10 cubic centimeters of serum was given. Three days later there was marked improvement in the paralysis, when a second injection was given, to be followed later by a third, after which the paralysis disappeared. Aubertin (Soc. Méd. des Hôp., Jan. 9, 1903), declares that the serum is of no use in the treatment of diphtheritic paralysis, a position that was maintained by Sevestre. Comby regards these *ex cathedra* utterances as insufficient to overcome the accumulating experiences that the serum is useful in the treatment of the late accidents of diphtheria. His first case was treated in 1902. In this communication he gives four additional cases, two of which were of considerable severity, in which recovery rapidly followed the injection of the serum.

Protargol in Infections of the Mouth in Infants.—Toretta (Il Progresso Medico, No. 1, 1904) reports on a series of cases treated with protargol. They number about 150, and include various infectious conditions of the mouth, such as stomatitis, aphtha, and impetigo. He has found that protargol is a specific in a large number of these cases. He uses a solution varying in strength from 1 to 10 per cent. in distilled water. With this a pledget of cotton is saturated and the solution applied to the mucous membrane of the tongue, lips and gums. The application is made once in twenty-four hours.

The Treatment of Whooping-Cough.—T. W. KILMER (Medical News, June 11, 1904) claims brilliant results from the use of bandages about the abdomen and chest in the treatment of whooping-cough. In all he has treated seventeen cases by this method. They were unselected, some of them severe; in no case was there failure to relieve in considerable measure the cough, and in all cases the distressing paroxysms of vomiting ceased. The application consists of a stockinet bandage from the axilla to the hips. The bandage should be made sufficiently tight to lessen the distress.

Endermol, a New Vehicle for Ointments.—COBLENTZ (Medical News, September 3, 1904). Endermol is a combination of stearic acid amide and paraffin hydrocarbons. It forms a white mass of about the consistency of lard. It has no odor and is of neutral reaction. When exposed to the air and sunlight under adverse conditions endermol retains its color, consistency, and smoothness. It is exceedingly bland when applied to the skin, and is readily absorbed. With mercuric oxide and the yellow and red iodide of mercury it makes a smooth ointment which shows no change upon exposure. As an ointment base it is better than petrolatum, as the latter does not mix with water. Lanolin is an excellent vehicle, but it is sticky and tough, and when combined with animal fats such ointments become rancid. Endermol does not become rancid even though 15 per cent. of water is incorporated with it, and at the same time it retains its penetrability.

The Clinical Features of the Epidemic of Dysentery at Tuckahoe, New York, During the Summer of 1902.—AUSTIN, O. L. (Medical Record). The writer is a resident of Tuckahoe, and preceding the epidemic for five and one-half years had not seen an unmistakable case of dysentery. Old residents say that about eighteen years ago a similar outbreak of the disease occurred. The first case was observed in July, about a mile and a half from the center of the village. Within a few days new cases appeared in widely separated localities. The epidemic reached its height the last of August, and diminished rapidly during September, only a few cases occurring in October. During the period the writer treated 134 cases. The origin of the epidemic has not been discovered. So widely scattered were the first cases, and families having no relation of any sort, that only a wide-spread source of infection could have maintained the outbreak. At first it was believed that the water-supply was the source of the infection, but less than one-half of those infected consumed the town water. The first case occurred in the family of a milkman of uncleanly habits, yet the succeeding 34 cases were in families not supplied with milk by this man. Nine different dealers supplied the infected households. Three infants were exclusively breastfed by cleanly and uninfected mothers. In all probability the Shiga bacillus was the cause of the disease, and it probably entered the system by way of the mouth, but it was not determined that any one article of food or drink was the medium. Cases occurred among all classes, yet the disease was by the far the most frequent in the homes of the poor. Thirty-one per cent. of all cases were in infants under three years, yet no age was exempt. Four cases died. Post-mortem examination showed the characteristic lesions of dysentery. Most of the remedies which are useful in dysentery were tried, but none were found to be of any use excepting total abstinence from food, active catharsis, and absolute rest. Early in the epidemic before this treatment was instituted no short cases were noted, but after it was employed the disease seemed in many cases to be aborted. From the onset water and unflavored tea were permitted if the patient would take them, but no food of any sort. Irrigation was of no service early in the disease, though it was valuable in those later cases which endured longer. In no cases did it seem to abort the disease. In the more chronic cases colonic irrigations were most efficient, and the best results were obtained in those cases in which they were carefully and persistently carried out. The simpler the method of irrigation the better the results. It is not necessary to introduce the rectal tube beyond three or four inches, and the best tube to employ is an ordinary catheter. Too much pressure should not be employed. as it excites early peristalsis. For each irrigation, whether for infant or adult, four quarts of saline solution was used. This was permitted to flow out of the rectum by the side of the catheter. If a return had not begun after the introduction of three or four pints of the solution, then the syringe was removed and the fluid permitted to escape through the catheter. The patient should make no expulsive efforts after the completion of an irrigation. If the catheter was permitted to remain in place practically all the fluid returned in a few minutes. Next to irrigations the most valuable thing in the treatment was the restriction of the diet. The five interesting features of the epidemic were its extent; the abrupt onset of marked symptoms without prodromata; the great prostration occurring almost at the outset; the severity and long duration of many of the cases; and the marked value of colon irrigattions and a narrowly restricted diet as remedial measures. During the summer of 1903 there were not more than ten cases of the disease in the vicinity where the malady had been epidemic the year before.

Hypodermic Injection of Strychnine Nitrate in the Treatment of Progressive Muscular Atrophy.—SANGER BROWN (Medical Record, August 6, 1904). Gowers has expressed himself hopefully in reference to the nitrate of strychnine treatment of progressive muscular atrophy. Brown, in a somewhat limited experience, confirms in part Gowers' favorable statement. He employs 1-25 of a grain hypodermically, given daily for six weeks. The treatment is resumed after an intermission of two weeks, and so on until several courses have been taken. Many patients can bear a larger dose, but better results are obtained when the particular dose is adhered to. He claims that strychnine nitrate given hypodermically is the only form that should be employed. When given by the mouth it does not have the same influence on the course of the disease.

The Bacillus Dysenteriae in Asylum Dysentery.—EYRE (British Medical Journal, April 30, 1904) contributes an article of both interest and value in its bacteriological investigations of an epidemic of dysentery in one of the London county asylums. After giving briefly the clinical history of the epidemic, in which 24 cases were met with, he discusses at some length his method of examining the feces. As a bacteriological medium he made use of an especially modified "lakmus-lactose-nutrose agar," this medium being originally recommended by Drigalski and Conradi. Bacteriological examination of the feces was made in all cases, while a bacteriological examination of the blood and of the bile was also made in all the cases that succumbed—six in all. From six of the 18 cases the bacillus dysenteriae was isolated, and this bacillus was strictly comparable to Shiga's bacillus obtained from Berlin and Philadelphia; further it was agglutinated at once in dilution of 1 to 200 by the antidysenteric serum (Shiga). The conclusions at which Eyre arrives are as follows: (1) That a bacillus identical with the bacillus dysenteriae, described by Shiga as the specific cause of acute dysentery in Japan, can be isolated from the stools of many cases of asylum dysentery. (2) That the blood serum of some of these cases of asylum dysentery possesses a specific agglutinative action when tested against bacillus dysenteriae isolated from the stools of other similar cases, and also against other strains of bacillus dysenteriae isolated from cases of dysentery in tropical countries. (3) That in order to detect the presence of bacillus dysenteriae the stools must be examined when fresh. (4) That post-mortem material must be collected and examined as soon after death as possible, as after a few hours' delay, even in quite acute cases, bacillus coli becomes the predominant micro-organism in the intestinal canal. (5) That under these conditions (3 and 4) the isolation of bacillus dysenteriae from the stools of patients suffering from acute asylum dysentery is comparatively easy by the methods indicated —when these stools are typically dysenteric to the naked eye. (6) That is case of chronic asylum dysentery, bacillus dysenteriae, if present, is so outnumbered by bacillus coli and other intestinal saprophytes as to render its isolation a matter of extreme difficulty.

Physiological or Functional Albuminuria.—The intensely interesting subject of the (so-called) physiological albuminuria is discussed in a short though interesting paper by WEST (Lancet, January 16, 1904). In the first place, West divides and subdivides the various forms of albuminuria as follows: (a) Cis- or pre-renal, subdivided into (1) cause obvious, as heart disease, fevers, etc., and (2) cause not obvious, i.e., physiological or functional. (b) Renal, subdivided into (1) obvious renal disease, and (2) no obvious renal disease, i.e., physiological or functional. (c) Citra- or post-renal, i.e., accidental, from urinary or genital passages, etc.

Thus, according to West, albuminuria is physiological when its cause is not obvious, but, as everyone knows, to regard any albuminuria in the strict sense as physiological is opposed violently by many clinicians. As West says, in physiological albuminuria every care has been taken to determine the cause, but without success; but it does not follow that because a cause has not been found no cause exists, and for this reason other names have been suggested for the condition, such as intermittent, postural, cyclical, and dietetic, but all the terms so far suggested are open to question. West, to determine the frequency of this condition, had a long series of observations made at various times of the day and under varying conditions upon apparently normal individuals, and he found that 42 per cent. at some time or another showed a trace of albumen in their urine. The figures usually given, however, vary from 1 to 10 per cent. Of West's 40 per cent., half showed only minute traces of nucleo-albumen. In half of these latter cases, however, the amount was so small that it could not be detected by the ordinary tests, while in the remaining half, i.e., in 10 per cent. of all the cases tested, the serum albumen could be detected by the ordinary tests. He then discusses numerous interesting questions suggested by those findings, such as the fact that albuminuria is intermittent, occasional or cyclical is no proof that the kidneys are sound; the fact that in granular kidney, as well as in functional albuminuria, the quantity of albumen may be tiny; the fact that the clinical importance of the albuminuria varies greatly with the age of the individual —for instance, the frequency of a mild albuminuria in newborn infants without obvious cause. The conclusions in regard to the whole matter are as follows: (1) Albuminuria may occur as a transitory symptom in persons who, except for this symptom, may be judged to be perfectly healthy, for they appear to be so at the time, and remain so. (2) But it may also occur in persons who, though they appear at the time to be healthy, develop signs of disease subsequently.

Stridor Thymicus in Infants. HOCHSINGER (Weiner medicinische Wochenschrift, November 7, 1903). In 1902 the author called attention to the fact that it was quite possible, clinically, and by radiography, to establish the size of the thymus gland in infancy and early childhood *intravitam*. Particular attention was paid to the children in whom the symptoms-complex of the so-called "stridor congenitus" existed. The clinical picture of the anomalous breathing of infants is about as follows: The curious breathing is present in newly born children or in the first few months of life, and consists of stridulous breathing that can be heard for a considerable distance. Sometimes this breathing develops soon after birth, but more frequently it comes on suddenly during the first few weeks of life without causing much distress. This noisy breathing, as a rule, lasts for months and usually disappears as suddenly as it develops. Ordinarily the characteristic breathing consists of a harsh sound which reaches its greatest intensity at the end of inspiration. The children are never cyanotic and have no dyspnea in the true sense of the word. The respirations are normal in frequency but are noisy on account of the respiratory stridor. In uncomplicated cases there is no elevation of temperature and the children do not appear ill. The children are not hoarse and are free from catarrhal symptoms on the part of the larynx. An inspiratory retraction above and below the sternum is invariably present. These retractions are not as severe as in croup, pseudo-croup or capillary bronchitis, but are always present. In spite of this symptom-complex, which points to some construction of the upper air passages, the children appear well and happy and, as a rule, develop normally. According to repeated instances in literature, however, this curious breathing anomaly, which in itself appears harmless, may at times go on to fatal attacks of suffocation caused by a great hyperplasia of the thymus. In the author's experience, the symptoms above described are, in the majority of the cases, thought to be caused by some catarrhal affection of the bronchi. This condition must be differentiated from capillary bronchitis and bronchial asthma. In these two affections expiration is more involved than inspiration. Inspiration is free but during expiration high-pitched whistling sounds are heard. The children are cyanotic and there is a well-marked diaphragmatic expiration. Five theories have been advanced for the pathogenesis of this condition: (1) a congenital malformation of the laryngeal entrance, (2) the presence of adenoids, (3) hypertrophy of the bronchial glands, (4) a nervous theory in which a posticus paralysis was supposed to be the cause, and (5) thymus hypertrophy. The author's paper was based on the study of about a hundred cases in which the characteristic breathing was present. There are no true laryngeal symptoms in the uncomplicated cases, the children are never hoarse and there is no croupy cough. Even those children in whom the noisy respiration is not decided, show the sub-sternal retractions. The author came to the conclusion that these symptoms could only be explained by changes in the thymus, and this opinion was verified because in every case an enlargement of the thymus could be made out on percussion. The author has, in the past two years, had Roentgen examinations made in these cases. In nursing infants the writer has been able to map out the thymus by percussion. Under normal conditions the thymus does not extend beyond the borders of the sternum, but in pathological enlargement of the thymus, it extends beyond the sternal borders.

The author was able to establish a positive relationship between rachitis and hypertrophy of the thymus since in thirty-two rachitic children he found an enlargement of the thymus in twenty-three. This enlargement of the thymus is produced in a way similar to the enlargement of the spleen in the same disease.

Scoliosis as a Result of Typhoid Fever. MUNIAGURRIA (Archives de Médicine des Enfants, November, 1903). The author reports the following case: A child of eight years was received on the 8th of February in the surgical division of the Rosario Hospital with the diagnosis of coxalgia. The previous history was that in November the child had had an attack of typhoid fever. There were the typical signs, epistaxis, prostration and a very intense and continued fever. On the ninth day the doctor ordered a cold pack and immediately after the child was taken with a severe pain in the left iliac fossa and the fever again rose. This prolonged the convalescence and the little patient was not even able to leave his bed or to walk on account of the intense pain in the region mentioned. As a result of the pain the thigh was flexed on the abdomen. On his admission to the hospital the diagnosis of psoitis was made and the leg was placed in an extension apparatus. After a month the pain had entirely disappeared. When the child was removed from the hospital, it was found on examination that there was a marked dorso-lumbar scoliosis, so that the body was decidedly inclined towards the left. The clinical interpretation of this case is of interest. The typhoid fever had produced a myositis of the ilio-psoas muscle, and a contraction of the left leg, induced by the painful retraction of this muscle and the scoliosis was produced by way of compensation. Muscular complications in the course of severe fevers are relatively frequent and affect very often the adductor muscles of the lower limbs. It is probable that we have to deal with inflammation of the muscle as a result of intra-muscular hemorrhages. The little patient instinctively avoided the pain produced by the extension of the left leg and he inclined to the left side in order to relax the long head of the ilio-psoas which is attached to the bodies of the lumbar vertebræ above and the lesser trochanter below and this effort of accommodation produced a primary lumbar scoliosis of the kind designated by Kirmisson as static scoliosis with dorsal compensatory curvature. The author treated this patient by gymnastics two hours every day. Success crowned his efforts and the child left the hospital after a month with his psoitis cured and his vertebral column completely restored to shape.

Intra-muscular Injections of Large Doses of Perchloride in Infantile Syphilis. IMERWAL (La Sem. Mèd., June 22, 1904). The usual methods of administering mercury by mouth or inunction being frequently rendered difficult or impossible in the case of infants and children, owing to the existence of gastric disturbances or skin disease, the writer resorted to intra-muscular injections of solutions of perchloride, and found the results so satisfactory that he now employs this method exclusively for the treatment of infantile syphilis.

The amount of drug injected varies according to age, and is as follows:—

At from 1 to 3 months	2 to 4 milligrammes
At from 3 to 12 months	5 to 10 milligrammes
At 1 year	10 to 15 milligrammes
At 2 years	15 to 20 milligrammes
At 3 years	20 to 25 milligrammes
At 4 to 6 years	20 to 30 milligrammes
At 6 to 12 years	25 to 40 milligrammes

The injections are repeated about every six days, and continued until all specific lesions have disappeared, from three to five being generally sufficient. The strength of the solution is 5 per cent. (for very young infants, 2 per cent.), and contains an equal quantity of chloride of sodium. The injections are best made on the upper and outer aspect. of the thigh, care being taken that the point of the needle is well within the muscular tissue. The usual antiseptic precautions must be carefully observed. The pain caused by the injection is slight, and of short duration. Signs of mercurial poisoning, such as salivation or stomatitis, are never noticed.

Peritonitis of Unusual Origin. LORENZ (Wein. klin. Woch., April 7, 1904. A child, 3½ years of age, was brought into the hospital in a very low state, and with all the signs of a severe general peritonitis. The illness had commenced three days ago, with constipation, vomiting, meteorism and pains in the right side of the abdomen, and had been diagnosed by the attending physician as appendicitis. Professor Lorenz, believing the case to be one of general peritonitis having originated in appendicitis, proceeded to perform laparotomy. When the child was under the influence of the anesthetic, a distinct fulness was perceptible in the right iliac fossa, and the diagnosis of appendicitis appeared to be now firmly established. Accordingly, a lateral incision on the right side of the abdomen was made. The coils of the small intestine and of the cæcum were found covered with fibrinous membrane, but the appendix showed no signs of having been the cause of the trouble. The peritonitis was moreover localized to the right iliac fossa, and there was no effusion into the abdominal cavity. The only conclusion was that the morbid process had an extra-peritoneal origin. The operator, therefore, peeled off the peritoneum of the right iliac fossa as if searching for the ureter, and found that the sub-peritoneal cellular tissue was completely infiltrated with pus. Peeling off the peritoneum in an upward direction as far as the kidney, and towards the median line as far as the vena cava, he found everywhere the same purulent infiltration. But, as the condition of the patient was becoming very grave, the operation had to be terminated without it being possible to fix on the cause of this vast-peritoneal infiltration. The child died an hour after the operation. The autopsy showed that the sub-peritoneal purulent infiltration extended from Poupart's ligament as far as the diaphragm, and involved the posterior half of the fatty capsule of the kidney. The inguinal glands of the right side were swollen, one of the superficial ones containing an abscess of thick pus of about the size of a pea. Now, before the operation a small excoriation had been noticed on the small toe of the right foot, but no importance was attached to it; but in the light of the fact revealed by the post-mortem examination, it became clear that this small excoriation had been the cause of the abscess in the inguinal gland, which in its turn had been the cause of the retroperitoneal inflammation and peritonitis. The pus of the inguinal gland, as well as that of the retroperitoneal tissue, contained the staphylococcus pyogenes aureus.

PEDIATRICS

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ORIGINAL ARTICLES

SUMMER COMPLAINT; CLINICALLY CONSIDERED

By D. E. English, M.D., of Mill Burn, N. J.

The different conditions that are spoken of under the general name of Summer Complaint may be conveniently grouped under three heads.

I. In the first group of cases we get the following history. The first thing noticed by the mother is unusual fretfulness of the baby, associated with partial loss of appetite. This is followed in twenty-four hours by an increased number of stools, from four to eight a day, the stools being more or less green and containing undigested milk curds. The baby now seems to be hungry all the time, due to the thirst of fever. The doctor sees the baby on about the fifth day, and finds it with a temperature of 102 degrees to 104 degrees F., pulse 130 to 170 and wirey, abdomen somewhat distended with gas; surface warm, especially the scalp; passages frequent, thin, green, and containing milk curds and mucus. If untreated or wrongly treated, and unwisely fed, these symptoms all become worse, convulsions and symptoms resembling those of meningitis ensue, and the baby dies, comatose about the twelfth day. This is summer diarrhea, properly so called, and is primarily due to bad feeding and indigestion.

II. In the second group of cases the mother first notices in the baby loss of appetite, and unusual quiet, or else the baby moans or frets feebly. It soon refuses food or water entirely, vomits everything taken. The passages are very little increased in number, if at all, are dark colored, and have an unnaturally repugnant odor. The baby is generally brought to the doctor on the third day, and is found in the following condition: Temperature in groin 93 degrees to 96 degrees, in rectum, very variable, ranging from 98 degrees to 104 degrees; pulse 70 to 90, very weak and soft; baby apathetic, stupid; eyes lustreless; muscles flaccid; abdomen retracted; hands feet, and ears cool, almost cold; prostration profound. The movements are of a dark slate color, moderately thin, very tenacious, and have a very foul odor. Later they become thinner, more frequent, of lighter color, and contain much mucus. Without active treatment the baby dies quietly 36 hours after first seen. This is severe ptomaine poisoning, and due to the indigestion of poison, more than to the formation of poison in the stomach or bowels by chemical or bacterial changes in the ingested food.

III. In the third group the baby, apparently previously well, is seized with a chill, frequently accompanied by a convulsion. It is generally seen by the doctor inside of half an hour, sometimes before the chill has passed off. He finds a baby that is evidently actively and alarmingly sick, fingers, toes and ears are cold; head and abdomen hot; pulse hard, wirey and often too rapid to count; temperature by rectum 103 degrees.

In about an hour the baby begins to have frequent movements of the bowels. The first movement will often appear natural, but they soon become thinner, greenish, and later on lighter and lighter in color, more and more thin until at last, if the baby lives long enough, they become of the nature of "rice-water." The temperature rapidly rises, sometimes reaching 106.5 degrees per rectum, the abdomen, at first of natural contour, flattens and sinks, constant vomiting comes on; the patient becomes very restless, rolling the head from side to side; the eyes begin to lose their brightness; the temperature falls rapidly; the rice-water discharge becomes continuous; and the baby dies about 40 hours after the initial chill. This is cholera infantum, and is comparatively rare.

In the treatment of these cases, one primary indication is common for all three groups. There is present in all some offending matter in the intestines, and it should be gotten rid of as soon as possible so as to prevent the further absorption of poisons. Calomel has been found clinically to meet this indication better than anything else. It is better given mixed with sodium bicarbonate. To a baby under a year old 1-10 of a grain of calomel and one grain of sodium bicarbonate may be given every hour or half hour according to age, until from one to 1½ grains of calomel have been taken. It should be given in powder form, slightly dampened, put into the baby's mouth, and followed by a little boiled water. In the first group of cases this is often all the medicine needed, although small doses of aconite and potassium bromide have a happy effect on the fever and restlessness. The baby's head should be frequently wet with alcohol, or other evaporating lotion, but it is better not to cover it with a cloth. When the temperature is high, a cold wet towel spread over the patient's body often does much good. If the diarrhea persists, it can almost always be controlled by bismuth subcarb. or subnit. in doses of from five to ten grains every 2 to 4 hours, given in powder form, until the movements become black. If 48 hours after the calomel has been given there still seems to be offensive matter in the bowel, the calomel may be repeated, or, what is probably better at this stage, a full dose of castor oil may be given. When the bowel is distended with gas the colon should be flushed with normal salt solution at about the normal temperature of the bowel, i.e., 100 degrees F. Sterile water should be given freely and frequently by the mouth, and even if vomited should be persisted with.

In the second group the need for relief is more urgent. The initial dose of calomel should be as large a one as the age of the baby will permit, one-half grain to one grain for a six months baby, followed by one-tenth every half hour or hour. Strong stimulation is quickly necessary; twenty minims of whiskey and one minim of tinct. nux vomica in hot water for the first dose, followed by one minim of tr. nux vomica every three hours, and ten minims of whiskey every two hours until the skin becomes warmer. If rejected by the stomach they should be given per rectum. The patient should be wrapped in hot flannel blankets and kept as warm as possible until reaction has taken place, and it has emerged from the profound condition of shock. If the bowels do not respond promptly to the calomel a soapsuds enema should be given. Later on when the temperature in the groin or axilla has become higher than normal, and the pulse has become stronger, the stimulant treatment should be gradually stopped, and the patient carefully cooled. When the bowels have been thoroughly cleaned out, bismuth should be given until the diarrhea is under control. Always give as much sterile water as the baby will take. The following prescription will be found useful:—

℞

Tr. Nuc. Vomicæ	wf xii
Tr. Cardamoni Co.	ʒiss
Ess. Pepsin (Fairchild)	
Spts. frumenti	aa ʒiiss
Glycerin	ʒii
Syr. Zingiberii	ʒiv
Aq. ad	℥ii

S. A teaspoonful in water every 4 to 6 hours for a child one year old.

During the last stages it is often well to add a little paregoric to the above. These cases are hard to save; sharp stimulation and heat are most urgently indicated, especially at first.

The treatment of the third group of cases, or cholera infantum, is not so satisfactory. One large dose of calomel seems to act best. Flushing the colon with hot water containing a little alcohol and hydrochloric acid seems to be of some benefit. Cold to the head and abdomen, and heat to the lower limbs is indicated. Sharp stimulation is necessary, as in the second group. Sterile water, slightly acidulated with hydrochloric acid, should be given as freely as the baby will swallow it, even if vomited. In the later stages opium should be freely used, with bismuth. Stimulants and opiates should be given by deep subcutaneous injection when neither the stomach nor bowel will retain them.

In these different forms of summer complaint the matter of nourishment often becomes a serious one. In all of them no food at all should be given in the first 24 hours, and frequently it is wise to withhold it for 48 hours, and occasionally for longer. During this time the patient should be given sterile water frequently, perhaps slightly acidulated with hydrochloric acid. When it becomes necessary to give food it will be found best, in most cases, to begin with egg-albumen water, prepared in this way: to ¾ pint of sterile water add the white of one egg, and about 12 drops of lemon juice. Immediately after taking this it is well to give four or five drops of the essence of pepsin. Six feedings of this may be given in 24 hours, and it should be given warm, about 99 degrees F. About the third day the baby will begin to be tired of this, and if nothing else is given, will reject it entirely on the fourth or fifth day. Therefore on the third day it is better to begin giving starch water. Boil barley or rice for four hours, making a thin gruel. Strain through a piece of fine, sterile linen or muslin; add as much salt as possible without making it unpalatable; and to each two ounces put ten or twelve drops of liquid taka-diastase. The taka-diastase should be added just before feeding. I do not think a moderate amount of cane-sugar in this does any harm, and if the baby likes it, he is more apt to digest it. This food should be alternated with the albumen water for two or three days, when the albumen water will probably be refused. After using the starch gruel for 3 or 4 days, cream or top-milk may be gradually and cautiously added. It should be given at about the temperature of the stomach. In cases of prolonged convalescence purgatives and temporary starvation may have to be repeated from time to time. At this stage castor-oil is the best purgative, as a rule, but sometimes the calomel again is needed.

It is hardly necessary to add that the baby should be kept scrupulously clean, and in the open air as much as possible. The diapers should be carefully disinfected, and the nurse should carefully wash her hands after changing the baby, and before handling its food. I direct the diapers to be boiled and laid on the grass in the sunshine. Some of the grandmother's tell me that if a diaper is taken directly from the green grass and put on the baby, the next movement will be green.

After the third or fourth day nothing will benefit these babies so much, or so quickly, as a change of residence. It is hard to tell why, but a baby with summer complaint is sometimes markedly benefited by being taken from a comparatively sanitary house to one in which the conditions are not nearly so satisfactory, even when it is only a few miles away, and in a more thickly settled neighborhood. This is puzzling; I do not know why, I simply record what I have seen happen.

But a change from mountain to shore, or vice versa, or from city to country, will often cause a wonderful change for the better, other things being equal.

It seems to me that moderate exposure to sunshine is of benefit. We used to think the baby must be kept in the coolest and darkest place possible, but I have them put in the carriage and kept out of doors, and for a good part of the time have them in direct sunshine, with the head carefully shaded. The clothing and wraps should be carefully regulated and frequently altered. When the skin is cool or cold and the pulse weak they should be warmly covered, but a baby's clothing should never be warm enough to cause perspiration. When the temperature is much above normal they should wear a thin shirt and a diaper only, whether in the house or outside.

HYDROTHERAPY IN SCARLET FEVER

By R. W. Marsden, M.D., M.R.C.P., etc.

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The term hydrotherapy includes of course the internal or external use of water irrespective of its temperature. It is my intention, however, to limit my remarks to its external use in the forms of baths, packs, etc., the temperature being either tepid or cold. Though the popular prejudice against the use of cold water in febrile states is no longer so strong as formerly, yet, despite the numerous recommendations which have from time to time been made of its utility in scarlet fever, there can be no doubt that its adoption is still not unfrequently neglected, to the detriment of the patient. It is quite true that sponging or packing is often made use of during the primary pyrexial period of the first few days, but its further continuance is discredited owing to the fear of it causing nephritis. Moreover cases of a severe anginose type with prolonged pyrexia from septic complications are commonly met with in which the perfunctory and occasional use of these methods is, in my opinion, quite inadequate for the production of the desired benefit.

Without entering at the present moment into a consideration of the etiological factors causing the supervention of nephritis in scarlet fever, I may say that I do not believe its occurrence to be so wholly independent of the severity of the febrile attack as is usually supposed. More especially I think this complication would be found to show an increased percentage if a comparison were made between severe anginose attacks lasting at least three to four weeks, and a similar number of mild cases. The steady impoverishment of the blood as the result of the septicemic process, with its secondary effects on the circulatory system, and the tissues generally, cannot but diminish the powers of resistance of each organ. In the case of the kidneys it would be surprising if the prolonged pyrexia and co-existent excretion of toxins or altered metabolic products did not even increase their vulnerability. In addition, with such attacks the skin not unfrequently becomes dry and harsh, an eczematous condition being superadded to the usual desquamation. It may thus, probably from a diminution in its function, predispose to the supervention of nephritis, and it is because of the inefficacy of occasional sponging as a material aid in these cases, and the necessity for the adoption of repeated and more energetic measures that I consider the subject demands further attention.

The introduction of the treatment of scarlet fever by the use of cold applications is to be specially credited to Dr. James Currie, of Liverpool. From his very interesting work on the effects of water, cold and warm, as a remedy in fever and other diseases,[1] it is clear that though he was not the originator of the method, yet he was decidedly the champion and promulgator of the use of cold affusions in febrile affections. He cites in detail numerous instances, including cases of scarlet fever, where the affusions were apparently used with great benefit, stating[2] that in upwards of a hundred and fifty cases of this disease in which he had uniformly followed the practice he obtained a degree of success so nearly invariable that it was impossible to contemplate it without emotions of surprise as well as of satisfaction. Experience showed him that the body temperature alone could not serve as a guide to the advisability or not of administering the affusions. He found[3] that the affusions were best given in the evening, but says they are "safe at any time of day, when there is no sense of chilliness present, when the heat of the surface is steadily above what is natural, and when there is no general or profuse sensible perspiration."

The use of cold affusions was subsequently supported by Trousseau,[4] who declared that he had never resorted to their employment without obtaining beneficial results. Not, as he says, that all so treated recovered; on the contrary, the majority died, yet even those who died experienced a temporary relief from suffering, the affusion, so far from proving injurious to them, always moderating the symptoms and seeming to retard the fatal termination. It would seem, however, that the use of cold in febrile conditions was far from general in Trousseau's time, for in his lecture he admonishes his young hearers to exercise great care in the choice of their cases in order to be prepared for the prejudice against it.

During a period of twenty years (1868-88) Reimer[5] saw 978 grave or hyperpyretic cases of scarlet fever which he treated by hydrotherapeutic measures. Cold compresses and cold ablutions, he says, had a soothing effect, but did not shorten the fever. The cold pack in 28 cases of great nervous excitement was followed not unfrequently by cyanosis and heart failure, whilst a cold pack prolonged an hour or more sometimes ended in fatal collapse. The cold pack with cold irrigation employed in 131 cases was satisfactory as regards its effect on the pulse, circulation and respiration, but it exerted little influence on the subsequent course of the fever. A tepid bath employed in 72 cases was useless, and was decidedly injurious if continued more than half an hour, causing a weak pulse. A bath of 95 degrees F. gradually cooled to 81 degrees F. or 75 degrees F., employed in 186 cases, caused collapse and sudden death more frequently than any other therapeutic measure. A cold bath of from 60 degrees F. to 75 degrees F. continued from five to eight minutes and accompanied by energetic friction over the whole body, employed in 363 cases, gave the best results of all the modes of applying water.

Leichtenstern,[6] from his experience, says that he considers the use of the cold bath to be the best form of treatment from the beginning of the invasion of scarlatina to the remission of the severe general symptoms. For children he recommends that the bath should have a temperature of about 68 degrees F. and be limited in duration to five minutes. For older patients the temperature may be reduced to 59 degrees F., and still limited to five minutes, since he agrees with Reimer that cold but short baths are to be preferred. This practice may be said to be essentially in agreement with that of Currie, since this writer informs us that the temperature of the water used by him was in general from 40 degrees to 50 degrees F., varying with the season of the year.

One can perhaps obtain the best idea of the present divided state of opinion upon this method of treatment in scarlet fever by a reference to one or two recent writers on the subject. Dr. F. Foord Caiger[7] says: "The high temperature usually proves refractory alike to the influence of cold applications and of antipyretic drugs, but the cold pack is not without value as a sedative." Dr. Clement Dukes,[8] though postponing ablutions save for purposes of cleanliness in mild cases until the close of the third week, yet admits that in certain severe cases cold sponging or the wet pack reduces fever, diminishes the frequency of the pulse, abates the cerebral symptoms, and induces sleep. Dr. J. Lewis Smith[9] concludes that "through the alleged benefit obtained by Dr. Currie the cold water treatment of scarlet fever came into use, and it has been continuously employed until the present time, often with benefit, but sometimes with harm and even death." Henoch[10] in severe cases with protracted high pyrexia recommends that the head should be covered with an ice-bag, a large dose of quinine given and the child placed in a lukewarm bath, not below 88 degrees F. He is decidedly opposed to "cooler baths because in scarlatina which presents a tendency to heart failure, cold may produce an unexpected rapid collapse more than in any other affection."

Probably the most complete and most recent résumé upon the subject is given by von Jürgensen.[11] This is essentially a recapitulation of Leichtenstern's conclusion, which I have already quoted. This observer, amongst a number of other beneficial reflex effects, noted the diminution of restlessness and the production of sleep as well as the lowering of the pulse-rate which he found occurred before and lasted for a longer time than the reduction in the body temperature. In addition the same writer specified the conditions in which the giving of cold baths is contraindicated. These are tabulated by von Jürgensen as follows:—(1) When cardiac weakness is so severe that attempts to increase the action of the heart by stimuli fail; (2) with laryngeal stenosis; (3) when hemorrhage occurs from the nose, mouth, etc.; (4) with inflammation of the joints. It is interesting in connection with the first two conditions to record the verdict of Currie, who directed that the cold affusions should never be given when the extremities are cold, no matter what may be the heat of the central parts, nor when the respiration is laborious, since "the oppression might be dangerously augmented by the sudden stimulus.

My own experience is based on a number of cases treated by the lukewarm bath as recommend by Henoch, but without the use of the ice-bag or the regular administration of quinine. When collecting the cases I was more particularly interested in the possible supervention of nephritis, and therefore excluded all those which recovered or died before the third week of the disease. This fact accounts for the paucity in the number of the cases in the accompanying table.

At the time this treatment by baths was carried out I was ignorant of the conclusions reached by Leichtenstern, Reimer, etc., and lacked the courage or boldness to adopt on my own initiative the severer measures favored by them. I was nevertheless much impressed by the benefits received from the lukewarm baths, and strongly inclined to consider that this constituted the best method of treatment, since in no instance had any untoward accident arisen. The baths were given as a rule every four hours, each bath lasting 15 to 20 minutes and a temperature, save in one or two instances, of 90 degrees F. In these respects I followed the method which had undoubtedly given excellent results in the treatment of typhoid fever, raising the temperature of the water, however, on account of the age of the patients, and adopting the baths largely with the view of their antipyretic influence, as well as for their tonic effect on the circulatory system, and reflexly on the excretory system and tissues generally. At the same time there was no relaxation in other treatment. The patients were regularly and suitably fed, and careful and frequent cleansing of the mouth, throat, nose and ears was of course continued. Of the 14 cases, of which seven were males and seven females, it will be noted that no fewer than nine were under five years of age. Some idea of the severity of the attacks will be gathered from the fact that the length of the pyrexial period associated with the onset of scarlet fever was in only one case as short as 16 days. In ten it was over 20 days, the longest having a duration of 32 days. In such a collection of cases the occurrence of only one death in a child three years of age after a continuous pyrexia average between 101 degrees F. and 102 degrees F. for 30 days, seems in itself to speak favorably for the treatment. It must not for a moment be assumed that I am claiming this as a percentage mortality. As I have already

No. Sex.	Age.	Type of Attack.	Pyrexia Averaged.	Baths Begun. Day.	Baths Stopped. Day.	Urine During Time of Baths.	Result.	Remarks.
1—Male	3	anginose	101.2° F. for 17 days	9	15	trace of albumen, free on 16th day	Recovery	
2—Male	3	"	101° F. for 32 "	2	38	trace of albumen throughout	"	
3—Male	3	"	102° F. for 23 "	4	20	"	"	
4—Female	5	"	102° F. for 17 "	3	16	trace of albumen on one day, otherwise free	"	
5—Male	3	"	101.2° F. for 30 "	11	27	either trace of albumen or free	Death	
6—Male	4	"	102° F. for 27 "	14	25	trace of albumen, free on 25th day	Recovery	
7—Male	8	"	101° F. for 28 "	4	24	trace of albumen throughout	"	
8—Female	2	"	101° to 102° F. for 12 days 101° F. from 15th to 27th day	18	32	large trace of albumen and later free	"	
9—Female	4	"	101° F. for 22 days	8	14	free from albumen	"	
10—Male	9	"	120° F. for 19 "	4	19	trace of albumen throughout	"	
11—Female	5	"	102° F. for 16 "	8	16	large trace of albumen throughout	"	baths at 85° F.
12—Female	1½	"	102° F. for 21 "	7	22	trace of albumen	"	baths at 95° F.
13—Female	4	"	101° F. for 30 "	7	21	free from albumen	"	
14—Female	6	"	102° F. for 26 "	4	22	free from albumen at first, later slight deposit	"	

stated, the series of cases is a specially selected one, and therefore not suitable for any ordinary comparison. I am, however, of opinion that a better result would not have been obtained without the use of the baths, whilst, on the contrary, one might reasonably have expected a worse one.

It will be noted that there was considerable variation in the length of time subsequent to the onset of the attack of scarlet fever before the baths were begun. This was largely dependent on the gravity of the case or the failure to observe satisfactory progress with indications of an unusually protracted pyrexia. In instituting this hydrotherapeutic treatment I was at first not personally convinced, not only of its value, but of its advisability, so that it was not resorted to until the need apparently arose. Whatever objections might be urged against this lack of uniformity, it is evident that upon one point it constitutes an especially severe test. At the present time there is a widespread belief that chill acts as a potent factor in the etiology of scarlatinal nephritis. Under these circumstances one would expect its influence to be greater the nearer the commencement of the adminstration of the baths approached to the usual time of the supervention of that complication. Apparently, however, in all cases there was no evidence, from an examination of the urine, of any deleterious influence on the kidneys even when they were begun as late as the 14th and 18th days of the attack. On the contrary, considering the average age of the patients, the degree and persistence of pyrexia and the severity of the associated scarlatinal and septic toxemia a greater cause for surprise would seem to exist in the small amount of albumen generally found in the urine. I do not think it unnatural to suggest that the occurrence of nephritis in scarlet fever may in some cases have a connection with the alterations in the skin (inflammation and subsequent desquamation) which constitute such a prominent feature of the disease.

There is no need for me to emphasize the close association which has been proved to exist between the kidneys and the skin. As I have already suggested in view of this association, it would be surprising if the dry, scaly and even eczematous condition of the latter, which is especially seen in severe, protracted and septic cases did not prejudicially affect the kidneys. Under these circumstances it may be that careful investigation would demonstrate rather a prophylactic influence, from the hydrotherapeutic treatment, against the supervention of nephritis. It would indeed be interesting for the elucidation of this point to have a large number of cases treated in an exactly similar manner, save that one-half received regular and frequent tepid or cold baths with friction, whilst the other half received only the usual and necessary ablutions for cleanliness. If such an observation has been made I have not seen a record of it. In three of the cases after a cessation from the administration of the baths lasting several days on the recurrence of pyrexia, subsequently they were immediately resumed, and in one of these cases there followed a very temporary hematuria and albuminuria. Its failure to occur in the other two cases and a knowledge of the vagaries associated with the methods of onset of nephritis in scarlet fever cause me to look upon this occurrence as accidental. From the fact, however, that any pyrexia subsequent to the second week connected or not with other local evidences of inflammation (adenitis, tonsillitis, etc.) may, after a variable period, be accompanied by signs of nephritis, I do not think pyrexia occurring after the period mentioned, when following an apyrexial interval, should be so treated. I am further strengthened in this belief that in these late pyrexial attacks, whatever may be their cause, the degree of temperature attained or the length of time it lasts rarely constitute an important or dangerous factor.

From the references which I have quoted earlier in this paper it will be remembered that various beneficial effects have been described by different writers as the result of the application in the febrile state at the onset of scarlet fever of water at temperature lower than that of the body. Personally it seemed to me that the most striking feature, and the one showing an immediate evidence of their action, was their sedative influence. In this respect they often acted in a manner remarkably similar to that met with in typhoid fever, the patients falling asleep directly after their completion.

Despite the fact that some writers are averse to cold baths on account of the danger of producing collapse, whilst others from a similar fear prefer them to continued lukewarm baths, it may yet be said that the consensus of opinion expressed is in favor of some form of hydrotherapy. To a certain extent the discrepancies in the statements may be only apparent, arising from different methods. If one considers the contra-indications laid down by Leichtenstern and mentioned by von Jürgensen concerning three of them (laryngeal stridor, hemorrhage, arthritis) there can be no difficulty. With the remaining point, however, the condition of the circulation, it is quite different. In accordance with the rule for abstention mentioned by Currie, viz., coldness of the extremities, or in the presence of cyanosis with a small, soft, rapid, running pulse, or with a temperature considerably below what ought to be expected from the general condition, one may feel that the indications are sufficiently clear for a general agreement. On the other hand, there must be numbers of cases on the borderland which have to be left to individual judgment and in which the results of treatment will be followed by differences in experience.

From the evidence of Leichtenstern and Reimer I think we may accept the conclusion that short cold baths frequently repeated give the greatest benefit, so that where there is no danger of producing cardiac failure, they, or such substitutes as the cold pack with friction, the cold mitten or ice rub rapidly performed, are to be adopted. In doubtful cases, however, and in young or weakly patients the lukewarm bath, as I have described, is to be preferred, and here again its duration should be short (10-15 minutes), since, as stated by Reimer a prolonged tepid bath causes a weak pulse and is decidedly injurious. Whatever the method used it is nevertheless necessary that the applications should be regularly and frequently repeated during the period of pyrexia or marked toxemia and that each application should be adequate to the severity of the case.

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A YEAR'S EXPERIENCE WITH THE CONVULSIONS OF CHILDREN*

By D. S. Hanson, M.D., Cleveland

This paper is written especially with reference to the etiology of the cases observed during a year's time.

When considering convulsions in children the fact must not be lost sight of that the nervous system of children, in many respects, is very different from that of the adult. The lower centers, which include the convulsive centers, both cortical and pontobulbar, are much more highly developed than the higher; consequently nervous control is less perfect, so that, what in the adult would perhaps produce little or no disturbance, might, through reflex or other nerve excitement, produce convulsions in the child.

It is the child with the hereditary neurotic or unstable nervous system, or of acquired nervous instability, that is most prone to fall into the convulsive habit.

Authors quite universally agree that there is an inherited convulsive tendency in some families, and we are all conversant with the fact, that epilepsy, drunkenness and the various cachexias including rickets and syphilis are very frequently transmitted in the shape of an unstable nervous system, with a tendency to convulsions.

The nervous system of the adult has acquired steadiness from long use of the voluntary centers and by the exercise of the will, a control habit we might properly call it. The child is a bundle of reflexes; his nerves and nerve ganglia are in a state of great and uncontrolled activity, ready to seize upon new impressions, especially if these are of an exciting nature.

The exciting causes of convulsions are mainly of three varieties:

1. Those due to reflex impressions, as teething, intestinal or cutaneous irritation.
2. Those irritating brain and ganglia by general systemic infection by toxins, as in acute febrile diseases.

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3. Those producing direct irritation of brain or spinal cord, as brain tumor or abscess, the exudation in meningitis, cerebral hemorrhage, etc.

The convulsions and other grave conditions which may arise in the apparently healthy brain from reflex exciting causes is truly remarkable. Starr reports a case of a healthy nine-months-old child who was given a hearty meal of cornbeef and cabbage which was promptly followed by a convulsion lasting several hours, and this by meningeal hemorrhage and hemiplegia. In my practice an acute paraplegia was completely relieved a few hours after proper attention was given to a long and filthy prepuce.

When we consider the comparative rapidity of brain growth during the first year of life, we are not at a loss to understand why nutritional disturbances during this period predispose to eclampsia.

Children with enlarged thymus are said to be especially liable to convulsions, and, when accompanied by small arteries and general lymphatic hyperplasia, the convulsions are often either fatal or eventually of the epileptic type.

In epileptic convulsions there is said to be an excess of the etherial sulphates in the urine; this does not seem to be true in other forms of eclampsia; why this should have a determining cause on the type of the convulsion, if it does, we are unable to explain. Just what determines the clonic or tonic nature of the convulsive seizure seems also to be imperfectly understood.

Cranial asymmetry, so far as we could determine from external examination, due to rickets or other causes, was not so prominent a factor in our cases as we had expected to find it.

The condition of the internal organs during the convulsive seizure is one of intense congestion, and luckily for the child, atheroma and calcareous blood-vessels are conspicuous by their absence.

Since the last meeting of this Society I have observed 19 cases in 14 children. Not all are especially interesting from the etiologic standpoint, quite a number being in no way unusual or greatly different from those usually seen. A classification of causes would place six in the group due to pulmonary irritation, a like number to intestinal irritation, one to cutaneous inflammation, one to meningitis and the remainder to the toxins of acute febrile conditions or causes not determined. The age varied from eight months to eight years, only one being over three and one-half years.

The cases were as follows:

Herbert K., aged 10 months, had had two tonic convulsions during the night, each of short duration. The next morning he had a slight fever and a mild bronchitis. He made a prompt recovery.

Willie S., aged 14 months, had had a short tonic convulsion the day before the rash began to appear in an attack of measles. The latter ran a normal course, but pneumonia developed as a sequel. The patient recovered.

Arthur H., aged two years and eight months, had a temperature of 104 degrees F. at a visit in the morning. The pulse and respiration were both rapid, the ratio being two to one with bronchial breathing over the lower right lobe. Later in the day he had quite a severe tonic convulsion; the lung hepatized and the case, excepting severe nervous symptoms, ran a normal course to recovery.

Ella K., aged 15 months, had pneumonia complicating whooping-cough with an extreme temperature and rapid heart action during the last four days of her life, with seven tonic convulsions during the last 12 hours.

Nellie K., aged eight months, was having an attack of whooping-cough complicated with gastroenteritis. The short clonic convulsion which she had was probably due in a measure to both complaints.

Willie B., aged one year and nine months, suffered with convulsions similar to the above-described case, due to two factors, pulmonary irritation and fright. The child was reaching above its head for a measure containing kerosene oil and pulled the measure over spilling the contents into his face. Enough of the fluid entered the mouth and nose to strangle the child, who immediately became cyanosed and went into a tonic convulsion which was repeated several times before my arrival. I found the child semi-comatose, the respiration rapid and difficult, the temperature very high. The child responded well to treatment, but respiration was rapid for two days.

Chas. P., aged two years nine months, was unconscious. The respiration was very irregular, much mucus rattled in the throat, the pupils were dilated, the pulse was regular and not very rapid, and the temperature was subnormal. The child had been having a severe clonic convulsion and was treated by a neighboring physician before my arrival. The spasm had lasted something over one hour. The following day the child was somewhat stupid, but made an uninterrupted recovery. The cause of the convulsion was an evening dinner consisting of wiener sausage and bananas.

Edwin O., aged fourteen months, has had 16 attacks of tonic convulsions since his birth. Each convulsion was of short duration and always preceded by a sharp rise of temperature and a few hours of restlessness; an active purge has always given relief; his mother says she thinks she has averted several attacks by giving an enema and a purge early. This case is extremely interesting because it illustrates how easily the convulsive habit can be formed. The family history does not show any special tendency to nervous disease. Both father and mother came from large healthy families, with the exception of one brother of the father who has rickets. This child is large and well developed with a shapely head and seems normal in every way. He is a gluttonous eater, and this probably is the exciting cause of his convulsions, in the majority of instances at least.

Herald V. was thirteen months old. His first attack was tonic in character, lasting but a few minutes; it was over before my arrival; the child had a temperature of 104 degrees F., the lungs were somewhat congested; he had vomited several times; the fever and bronchitis lasted a few days. The attack was probably due to wiener sausage which the child had been eating a few hours before. The second attack occurred about two months later, again tonic in character and of short duration. The mother had weaned the child about a week before this convulsion and for some unaccountable reason he would eat or drink nothing warm, and the convulsion was probably due to digestive derangements from the character of food taken.

George B., aged one year six months, had had two attacks three months apart, clonic in character. These attacks were interesting to me from the extreme difficulty of getting the spasm under control. Chloroform was administered three times, in each instance to full surgical anesthesia, before relaxation remained complete. In each case the child seemed entirely well after a few hours sleep. The mother of the child is an irresponsible person and denied giving the child anything to eat excepting breast milk, but she gave it so little attention that the other children probably gave it anything they happened to have to lunch upon. This child has a small asymmetrical head, rosary on the ribs, and is not well developed. One brother died at six years from syphilitic stenosis of the bowel, the father is syphilitic and mother's family are nearly all immoral.

Frank M. was eight years of age. This was the fourth or fifth attack, the convulsions lasting in each instance until relieved by chloroform inhalation. This child is of an extremely nervous temperament, is under size, and the head is small and asymmetrical; the family history is negative. Rachitic diathesis is probably the etiologic feature, and indigestion the exciting cause.

Nellie S., aged three and a half years, has a good family history. The convulsions in this case occurred during the latter stage of scarlatina. The latter was not of an especially severe type and was treated by bath at 90 degrees F. and the usual medication for throat, and chloral and the bromids for restlessness. In spite of measures used restlessness could only partially be kept under control. Kernig's sign was present after third day and after the temperature had become nearly normal she became semi-conscious, the muscles of neck contracted, the eyes crossed, and finally coma and convulsions supervened. The child died on the seventh day; the kidneys were active throughout the illness and the child no doubt died from meningitis.

Emma M., aged two years, had been very extensively burned two days before I was called and was under care of another physician. She was in clonic spasm when I first saw her, and she was only relieved by prolonged effort and extreme narcosis, requiring all the *nerve* a medical man could summon in the heroic measures necessary to use; at last the convulsion subsided, but the child never regained consciousness and died several hours later. The severity of the burn made the case hopeless from the first.

Edna W., aged eleven months, suffered a first attack which was followed by three attacks at 13, 14 and 19 months, respectively, all clonic in character, the first three were of the right side and the fourth of the left side. This child is congenitally blind, the eyes to all appearances being normal. The cause of blindness is due to some brain lesion. She is in constant writhing, swaying motion which at first sight resembles chorea. She is well nourished and of good size, having had an abundant supply of mother's milk. The first attack was of the right side and was controlled with inhalation of chloroform, but recurred one or two hours later. It was again gotten under control in the same manner, each time supplemented by chloral enema. This attack was followed by a right hemiplegia (complete of motion and partial of sensation) which subsided so that she was in her usual condition at the end of a week. The second attack was much the same as the first, only the hemiplegia was less well marked and recovery was not so prolonged. The third attack, 20 days later, was much like the first two, but, if possible, more difficult to control, and was followed by sharp attack of fever which was relieved by active purge. The fourth attack involved the left side, and the face was more markedly affected than on previous occasions. A feature developed here which was interesting: the large toe would continue to jerk after the child was thoroughly narcotized and only subsided after chloroform was pushed to the limit; the convulsion would then return upon the withdrawal of chloroform, always beginning in the large toe. This attack was caused by a mild tonsillitis. Of all these attacks none except the last appeared to have an exciting cause, and it will be noticed that different areas of brain were involved, the last time being of the left while first three were of the right side.

The family history in this case is most interesting: the father and mother are apparently healthy, the former works in a brewery and indulges freely in beer. The father's mother died of cancer; he has two sisters and two brothers, the former are very immoral. The family of the mother is of a low grade of intelligence. There were three children, the oldest was a deaf-mute and died of convulsions at three and one-half years, the second child, who seemed normally developed, died at eight months of convulsions, our present patient was the third and last child. Such a nervous involvement can rarely be traced in a family even in which rickets or syphilis is present, while this family is free from both and all other predisposing causes, barring alcoholism of the father.

A word about treatment and we are through: Holt says a physician called to see a case of convulsions should have with him chloroform, a hypodermic syringe and morphine, a rectal tube or catheter, a syringe and chloral hydrate.

Chloroform inhalation is most reliable but should be supplemented by chloral enema. The initial dose for a child: six months of age, four grains; one year, six grains; two years, eight grains; dissolved in one ounce of warm milk, injected high and repeated in a half hour if necessary.

When the convulsion recurs as soon as the chloroform is withdrawn or chloral is expelled, a hypodermic injection of morphine should be given: at six months, 1-48 grain; at one year, 1-24 grain, and at two years, 1-16 grain; and repeat in a half hour if no effect is observed.

Convulsions due to asphyxia are oftenest best relieved by inhalation of oxygen.

Personally I have not used morphine or oxygen, but believe in selected cases they would be useful, but chloroform and chloral as advocated has served my purpose well, although taxing my will power, in several cases, to the very limit.

GENIUS AND EPILEPSY, AND THE EFFECTS OF EPILEPSY ON THE MIND*

By Dr. William P. Spratling, '86.

MEDICAL SUPERINTENDENT OF THE CRAIG COLONY FOR EPILEPTICS.

No matter to what extent we may analyze and compare, no other disease that affects mankind is so mysterious, so little understood, less scientifically studied, and more empirically treated, than the "falling sickness" of history that was clinically described by Hippocrates, the father of medicine, over three thousand years ago.

Epilepsy exempts no race, color, age, or condition in life, and while it is found with great frequency in all countries, it has been meagerly studied in only a few.

Its victims are numbered by millions. A conservative estimate places the proportion of them at 1 to 500 of the population at large.

In the great commonwealth of New York alone there are 14,000 or 15,000, while in the United States there are not less than 150,000.

Up to the twentieth year, epilepsy affects males and females alike. After that age, men suffer more than women in about the proportion of 100 of the former to 80 of the latter.

Up to twenty years, the causes (which are legion) are identical in the two sexes. After that, head injuries, alcoholism, and syphilis, cause the disease oftener in males.

In a statistical study of 68,040 cases I collected from the literature in this country and in Europe, and running back just half a century, 36,865 were males and 31,175 were females.

Its attacks may appear but a few times in a long life, or hundreds, even thousands, of times in 24 hours.

Taking acute and chronic cases alike, the disease is curable in 5 per cent. to 10 per cent. Taking recent or acute cases only, the percentages of cures, under proper treatment long enough continued, should be double that.

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*Read before the meeting of the Alumni Association of the College of Physicians and Surgeons, Baltimore, Md., May 17, 1904.

The type of the fit, the mental condition, the form and degree of heredity and the frequency of attacks, all influence the prognosis. The number of attacks alone has no bearing on curability. A male epileptic at the Craig Colony was permanently cured after having had not less than 50,000 to 60,000 well marked seizures, extending over a period of 18 years. He has now been well 7½ years.

The ancient synonyms of epilepsy are very numerous. A few like the two or three I give below suffice to show in part the mysticism, the superstition, and the unscientific ideas from my point of view that have wrapped the disease in a cloud of obscurity to this time:

Morbus Sacer.—The sacred disease; so-called because the priests of Apollo and the Sibylline priestesses were either in epileptic fits just prior to the pronouncing of prophecies, or pretended to be so.

Morbus Herculeus.—The Herculean disease; so called possibly on account of the resistless grasp of the attack, but more probably because Hercules was a victim of it, as typified in the story of the garment of Nessus. After the destruction of Nessus, Hercules is said to have made a shirt of the hide, and having donned it could never get it off, but committed suicide to escape its torture. Some regard this story as merely a figurative description of the last stage of epilepsy, while others think it possible of better interpretation.

Morbus Sideratus.—The star-struck disease. The ancients thought the epileptic had received a blow from a star or was blasted by the influence of some heavenly body. The frequency of the visual aura, when the patient sees flashes of light, stars, or other luminous bodies, may have helped to bestow this name.

Morbus Deificus.—The God-making disease. It seems that epilepsy acquired this name because of its potency in increasing the priest's reputation for sanctity. The symptoms of this phase were chiefly those pertaining to religious frenzy. The Greeks called it "The Priestly Disease."

While it would be interesting to touch upon a classification of epilepsy based upon etiology, time forbids it; so I will only mention its four symptomatic designations which we can use in discussing the effects of the disease on the mind in cases of different types.

To say at this time that a person has epilepsy has for the epileptologist little meaning. We must specify types, the varieties and subdivisions.

There are four chief forms of epilepsy: Grand Mal, Petit Mal, Psychic and Jacksonian, which we may concretely describe as follows:

Grand Mal.—A severe fit, the worst form of epilepsy.

One in which consciousness is always lost, and in which motor coordination is completely destroyed.

In such attacks the patient always falls or is thrown to the ground, generally with great violence.

Petit Mal.—A mild fit.

One in which consciousness need not be entirely lost; nor is motor co-ordination of necessity entirely destroyed.

In Petit Mal attacks the patient may not fall or be thrown to the ground, although there is some muscular involvement, either general or local.

Jacksonian.—A form of monoplasm, the convulsive movements being confined to one leg or arm, or groups of muscles, and in which consciousness, as a rule, is not lost.

Amplification of Jacksonian attacks may in time cause complete loss of consciousness and muscular control—Grand Mal, in other words.

The patient seldom falls or is thrown to the ground, during the earlier stages of the disease, at least.

Psychic.—A temporary blank in the field of consciousness.

A pathologic lapse in memory, varying from a second or two up to days and even weeks, and rarely accompanied by muscular disturbance of any kind.

This is the "silent" form of epilepsy. An inexperienced ob server may be looking a psychic epileptic in the face while a seizure is in progress, and fail to detect that anything unusual is going on.

This form of the disease constitutes one of the most interesting problems the medical jurist can encounter.

The effects of epilepsy on the mind, in point of time, are temporary, prolonged, or permanent. Temporary effects include transitory disturbances that appear with the convulsion, as a part of it, and that disappear with it.

Prolonged effects include disturbances that precede or follow the convulsion, while permanent forms include all varieties of mental unsoundness from simple loss of memory to complete epileptic idiocy, imbecility and dementia.

The whole subject of psychic deterioration in epilepsy comes under two heads: Paroxysmal and Inter-Paroxysmal.

Paroxysmal Mental States Due to Epilepsy.—1. Psychical epilepsy: A morbid entity complete in itself and which is destructive of all responsibility so long as it lasts.

2. Epileptic automatism: A condition in which the mind is blank while the body remains active. This usually follows severe attacks, though it may follow lesser ones as well.

3. Pre- and post-paroxysmal mental disturbance, usually in the form of the most violent mania, lasting from a few minutes up to days or weeks, and in rare cases even longer.

4. Epileptic mania: In which the mental disturbance coincides with the fit. In cases in which it is a substitute for the fit it is known as the "physical epileptic equivalent."

Inter-Paroxysmal Mental States Due to Epilepsy.—1. Transitory ill-humor and simple loss of memory for recent events; in other cases, for events regardless of the time of their occurrence. To these we must add, emotional irritability, impulsiveness, moral anergia, and incapacity for productive activity dependent upon initiative in conception.

2. Slight clouding or dulling of the intellect, that becomes more pronounced just before the fit.

3. Feeble-mindedness.

4. Imbecility.

5. Idiocy.

6. Epileptic dementia.

7. Acute confused insanity characterized by delusions, hallucinations and illusions. The two latter are quite rare. It is also rare to meet with acute states of depression characterized by painful delusions or by suicidal desire. We may readily group all the psychoses that come under acute confusional insanity under the broadly generic term "manic-depressive insanity," which includes the usually recoverable forms of mania, simple and recurrent; melancholia, simple and recurrent; and circular insanity.

While we seldom meet with circular insanity in epilepsy, we find such cases occasionally. Two of the kind have come under my observation. Both ended in permanent dementia.

The effects of psychical epilepsy in cases in which the disease exists for years, vary greatly. It has generally been assumed to be the most destructive intellectually of all the epilepsies, but this is not true in all cases.

Much depends upon the cause, the age at which it develops, and the stamina of the patient.

I know several epileptics with whom a rational conversation may be carried on while they are in the automatic state, but I have never witnessed a case in which any knowledge of the conversation could be recalled by the patient after the automatic period had passed away.

It has been my observation that the acts, mannerisms, peculiarities, habits of vocation, and the like, possessed by the individual in his normal state can be carried over into and most perfectly repeated in the automatic state.

But it is impossible for the automaton to carry the memory of such acts out of this state into the conscious state beyond. I have repeatedly tested this point, and have never found an instance in which it did not hold true.

Psychic epileptics commit all manner of crimes: theft, arson, rape, assaults, homicides, for which they are not responsible. Their bodies act without any direction from the mind.

People who suddenly disappear without known purpose for indefinite periods, and are finally heard from in some remote locality and are unable to explain how they happen to be there. should be suspected of being victims of this form of epilepsy.

Pre- and post-paroxysmal mania refer to maniacal conditions due to epilepsy that develop just before or just after the fit. They are apt to be conditions of great violence. The patient may prepare for days for pre-convulsive mania: he becomes irritable. loquacious, finds fault, is "touchy"; discredits the motives of those about him; is unable to sleep well, has terrifying dreams; headache, is feverish, and not infrequently has falsification of the special sense perceptions.

Some have delusions of persecution, others illusions. while hallucinations of sight occasionally occur just before the fit, and are mostly of a terrifying nature, though in rare instances they may be pleasant, even ecstatic.

Paroxysmal or Epileptic Mania.—Some grand mal attacks are accompanied by the greatest psycho-motor violence it is possible to conceive of.

Such violence finds no parallel in any other form of insanity. The patient is in a state of the wildest frenzy—epileptic furor—rushing blindly about in irrepressible rage, striking and assaulting everyone he comes in contact with.

These excessive frenzy states are generally brief, rarely lasting more than a few minutes up to a half hour, though they may be rapidly repeated. Epileptics in this state are exceedingly dangerous and may commit the most atrocious and inhuman crimes.

Transitory Periodic Irritability.—Through daily intimate contact with several hundred epileptics for a number of years, I have had abundant opportunity for observing the temperamental effects of the disease. It is scarcely a morbid entity, unless we call sudden anger, irritability, or unprovoked sullenness morbid entities also. Periodic ill-humor must be looked upon as a distinct forerunner of the convulsive attack as well as a result of it.

Among the scores of cases that have had weekly access to my consultation room for years, I have learned to detect with almost unfailing certainty the approach of a convulsion, a few hours or even several days off, the moment the patient enters the room and begins to speak. An almost imperceptible change in personality has been wrought. The patient is querulous, fussy, fault-finding, nothing goes right; trifles that ordinarily produce no effect on him now completely engage his attention. His friends ignore him, his family is indifferent to his needs and his condition; his fellow patients are no longer congenial, their attacks disturb him, and he can't endure their jocose remarks, distorting them into expressions of ridicule. These ideas loom up larger and larger on the horizon of a heated mind, until they pass into established delusions, all being dependent upon the subtle, pernicious influences of the approaching attack, and all completely disappearing as if by magic after the attack is over. In some cases ill-humor periods begin a day or so only before the fit; in others they come on weeks before, while in rare instances they come and go without the occurrence of a seizure, being, as it were, a long-drawn-out, silently discharging seizure—a fit without a climax.

Memory.—Of all the faculties of the mind, the memory in epilepsy is the first to suffer, in fully 90 per cent. of all cases. The extent of this depends a great deal upon the frequency, type, and severity of the attack—more on the type than anything else. In motor epilepsy, the attacks may be frequently repeated daily for years, with scarcely any appreciable loss of memory. In other cases in which there is greater psychical involvement, the memory is affected early and in a marked degree, while in epileptic dementia, idiocy and imbecility it is, of course, completely destroyed.

I have repeatedly observed a single seizure destroy the memory of a thing the individual was especially charged not to forget. A skilled mechanic was sent to a neighboring village on an errand. Half-way there he had a mild seizure that left him automatic for a few moments. When consciousness was restored he was totally unable to recall the purpose of his errand, and had not done so an hour later when he was reminded of it. In the meantime he appeared perfectly rational in every respect.

The fact that isolated seizures destroy recent memory impressions makes it difficult to teach epileptics under purely intellectual systems. A maximum of reiteration is required, often with a minimum of results. We must repeat the instruction over and over.

Feeble-mindedness, imbecility, idiocy and dementia are conditions that not infrequently follow epilepsy.

Fully 20 per cent. of all epileptics become insane, while 80 per cent. suffer mental enfeeblement in some deree.

Many scientific facts of great interest attach to each of the forms of mental unsoundness just enumerated, but the length of this paper forbids their review.

Different types of epilepsy produce in time different types of mental disease.

Some epileptics with purely motor or Jacksonian fits may have thousands of seizures extending over a long life and yet possess mental faculties in the end hardly impaired in any degree.

Others with certain inherited taints and feeble stamina, and attacks that are largely or wholly psychical in character, suffer a loss of all, or nearly all, mental power in two or three year's time.

The mental status in epilepsy should always be accurately considered before a prognosis is given. It is often the one guiding point.

Genius and Epilepsy.—Much has been written on the relationship between genius and epilepsy. I do not feel that any disease which tends to destroy mental power like epilepsy does, is capable of conferring unusual intellectual capacity. I agree with Sir Lauder Brunton when he says:[1] "It is quite true that some of the most remarkable men in the world's history have been epileptics, but I do not think that Julius Cæsar, Napoleon, or Mohammed were great because they were epileptics. As a rule, epilepsy tends to destroy mental power rather than to increase it, and the curious lethargy which Napoleon exhibited at the battle of Leipzig, and which there led to his defeat and consequent ruin, is probably rather to be ascribed to his epileptic tendency than to the indigestible bun which is said to have led to the disaster. Julius Cæsar and Napoleon were great men, not because of their epilepsy, but in spite of it; and the visions of Mohammed alone would not have given him his extraordinary power over his countrymen and over the then known world, had it not been that they were backed up by extraordinary mental power and energy in the intervals between his fits."

Lombroso,[2] in speaking of the "Epileptoid Nature of Genius," says: "It is sufficient * * * to recall to the reader the numerous men of genius of the first order who have been seized by motor epilepsy, or by that kind of irritability which is well known to supply its place. Among these we find Napoleon. Moliére, Cæsar, Petrarch, Peter the Great, Mohammed, Handel, Swift, Richelieu, Charles V., Flaubert, Dostoieffsky and St. Paul."

Lombroso admits that convulsions made their appearance rarely in the course of the lives of these men, and suggests that regular attacks were replaced by psychic equivalents, which he thinks "are more frequent and intense when motor convulsions are lacking"—a proposition I am unable to accept.

Because an epileptic fails to have frequent motor or psychomotor convulsions is no reason, in my opinion, why he should have frequent psychic attacks.

Above all, in Lombroso's opinion, is the relationship between genius and epilepsy to be proved "through the analogy of the epileptic seizure with the moment of inspiration, and it is further demonstrated by the even more cogent proof—the confession of eminent men of genius, such as Goncourt, Buffon, Mohammed and Dostoieffsky." The finest illustration of this to be found in literature, perhaps, is by Dostoieffsky in "The Idiot," Vol. I., p. 296.

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[1] "Journal of Mental Science," XLVIII, No. 201, April, 1892.

[2] "The Man of Genius."

"I remember," says the author (evidently referring to himself), "among other things a phenomenon which used to precede his epileptic attacks when they came in the waking state. In the midst of the rejection, the mental marasmus, the anxiety, which the madman experienced, there were moments in which all of a sudden the brain became inflamed, and all his vital forces suddenly rose to a prodigious degree of intensity. The sensation of life, of conscious existence, was multiplied tenfold in these swiftly passing moments. A strange light illumined his heart and mind. All agitation was calmed, all doubt and perplexity resolved itself into a superior harmony, a serene and tranquil gaiety, which yet was completely rational. But these radiant moments were only a prelude to the last instant—that immediately succeeding the attack. That instant, in truth, was ineffable."

Later on, when the attack was over, the author's reflections ran thus: "Those fleeting moments in which our highest consciousness of ourselves—and therefore our highest life—is manifested, are due to disease, to the suspension of normal conditions; and, if so, it is not a higher life, but, on the contrary, one of lower order."

Strangely enough, he then goes on to say: "What matter, after all, though it be a disease—an abnormal tension—if the result (as I will recover health, remember, and analyze it) includes the highest degree of harmony and beauty."

The confessions of Dostoieffsky and Flaubert are similar to feelings described to me by epileptics of superior intellectual endowment. Two in particular detailed the sensations of intellectual aura they experienced, which would readily pass for these confessions. They had such aura rarely, and declared it to be "the most overwhelming ecstatic state it is possible for the human mind to conceive of." Both were teachers of noted ability and both developed epilepsy through excessive alcoholic indulgence—not drinking enough at one time to produce drunkenness, but drinking systematically for years to fortify a nervous system exhausted through overwork.

No less interesting than the foregoing are Swedenborg's insane manifestations due to epilepsy.[8]

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[8] We only touch upon the vagaries of this unique character in this connection, and suggest to those who wish to pursue the subject further, the reading of Maudsley's "Body and Mind," and William White's "Emanuel Swedenborg: His Life and Writings."

Always eccentric to a marked degree, it was not until his fifty-fifth year that his particular malady became conspicuous.

Authenticated instances in detail are cited by Maudsley, in which Swedenborg passed through all the phases of the epileptic convulsion, even to frothing at the mouth. A record in his diary is this: "There happened to me something very curious. I came into violent shudderings, as when Christ showed me His Divine Mercy. The one fit followed the other ten or fifteen times." Apparently this meant serial epilepsy.

"In 1874, when he was fifty-five years of age," says Maudsley, "Swedenborg suddenly abandoned his former pursuits and interests. He claimed to have been admitted into the spiritual world, and that he possessed the power of talking with angels. Coincidently with this great change and new missions, he was entering into what an unprejudiced person must affirm to be the product of madness; this condition finally developing in unmistakable form."

"Is it not reasonable," asks Maudsley, "to infer that those new and strange pictures were the outcome of his madness? His disciples say not, but those familiar with the product of diseased epileptic fancies see nothing but epileptic phenomena in them."

Because of the frequency and extent to which epilepsy impairs the emotional balance, for the same reason apparently it stimulates the creation of delusions, hallucinations and illusions that partake of a religious order, or are wholly religious in their expressions. So long as such phenomena remain free from interpretation by the patient as constituting divine commands, the individual is less likely to do violence than when he feels impelled to carry out such commands. It is never wise to assume that epileptics of morbid religious tendencies are safe to be at large. Divine commands appear to them as sudden inspirations and generally lead to acts of great violence. Without exception such persons require the restraint of hospitals for the insane.

L. B., a young adult epileptic, proclaimed these sentiments for months: "God has told me that in my next life I would be born of C. H. S. and marry my last sweetheart, and be a millionaire, and that I would be a strong, hopeful, good, powerful Christian millionaire. I feel God's voice in my left ear at night. I feel the Lord in my chest. I see stars in my eyes during the day, which are the Holy Spirit. I have seen Christ crucified. I am cured of my fits; I have worked them off by asking the good Lord to forgive my sins. God told me I would never have any more fits. God told me to bite off a patient's ear. If God told me to do wrong, it feels as if I would do it. God told me the world was coming to an end very soon. The Holy Spirit has been working on me twenty-two weeks."[4]

It has often been observed that the nature of the delusion bears some relationship to the character of the mind from which it springs. The form of the insane person's vocation is therefore likely to be reflected in the genesis of his delusions. It seems as reasonable to picture the expression of morbid, exalted and ecstatic states encompassing a wealth of perverted intellectuality as coming from minds of great natural endowment, such as Mohammed's, Swedenborg's and others, as to picture more commonplace delusions as springing from minds of inferior capacity. Had Swedenborg or Mohammed been actively epileptic in their youth, probably neither would have stamped his individuality upon history as he did.

We are told that the picture given the world by Taine is the completest view of Napoleon ever given by any historian. "To anyone acquainted (we quote again from Maudsley) with the psychologic constitution of the epileptic it becomes clear that Taine has given us the subtlest and most precise pathologic diagnosis of a case of psychic epilepsy with its giant megalomaniacal illusions, its impulses, and complete absence of moral sense."

"I see no reason," says Professor William M. Sloan, author of a most admirable and complete "Life of Napoleon," "to question the fact that Napoleon I. was an epileptic. There were, I think, two instances when he had short seizures which did not amount to fits, but were regarded by contemporaries as symptoms of epilepsy."

It seems evident that such attacks were either petit mal or psychic, similar to those experienced by Julius Cæsar. In Appian's "Roman History" we find this reference to Cæsar: "At length, whether he lost all hope, or else for the better preservation of his health, never more afflicted with the falling sickness and sudden convulsions than when he lay idle, he resolved upon a far distant expedition against the Gatæ and the Parthians."

In Seutonius's "Lives of the Cæsars" we also find the following concerning Julius Cæsar: "He is said to have been tall, of a fair complexion, round-limbed, rather full-faced, with black eyes, and lively; very healthful, except toward the end of his life he would suddenly fall into fainting fits, and be frightened in his sleep. He was twice seized with the falling sickness in time of battle."

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[4] Shortly before his committment to a hospital for the insane, he endeavored to obey a "divine command" by almost biting off a fellow patient's ear.

We might continue to pursue the study of men of genius written in history as epileptics in a far more elaborate way, without learning anything more convincing than the facts apparent in the cases cited, namely:

1st. None of the historical characters mentioned had epilepsy early in life so far as the records of history go to show.

2d. They all developed it late in life in comparatively mild forms that were not temporarily incompatible with the highest intellectual endowment.

3d. Such great mental power as Cæsar, Napoleon, Mohammed, Swedenborg, and other historical characters had, must reach its full maturity before epilepsy appears; for essential epilepsy once present tends to impair or destroy it in every case without exception.

SOCIETY PROCEEDINGS

AMERICAN PEDIATRIC SOCIETY

Sixteenth Annual Meeting at Detroit, Mich., May 30 and 31, and June 1.

The President, AUGUSTUS CAILLÉ, M.D., in the Chair.

MONDAY, MAY 30: FIRST DAY

INTUSSUSCEPTION: CURE BY SLOUGHING OF THE INTUSSUSCEPTUM.—The case of a baby, seven months old, was reported by Dr. Irving M. Snow of Buffalo. After a duration of sixteen days illness there were symptoms simulating ileocolitis, and a gangrenous intestine protruded from the sinus. Recovery took place after six inches of the intestine which protruded from the sphincter had been taken off. Four similar cases were also reported in abstract by the same speaker.

INFLUENCE OF LABORATORY FEEDING AND WEIGHT INDEX OF INFANTS SUFFERING FROM DISEASES OF THE GASTROINTESTINAL TRACT.—Dr. Maynard Ladd of Boston had studied the effects of laboratory feeding upon 216 infants with ileocolitis, fermental diarrhea and other diseases of the gastrointestinal tract. These infants were under treatment at the clinic for periods varying from one to thirty-one weeks, and the average duration of illness was about seventeen days in the acute cases, while some of the chronic ones had continued for several months before coming under observation. The weight increase of each infant was used as an aid in estimating the effects of the method of feeding upon children of varying ages and stages of development. The infant's weight was taken at the beginning and end of treatment, and the ratio of this weight to that of the average normal infant obtained, the result being the *weight index.* More than half the cases under consideration had a weight development of only 40 to 70 per cent. of the normal, when they were first placed under observation. The author divided the results of his observations into four groups, as follows:

The first group comprises those infants who made complete recovery from the acute gastric and intestinal symptoms, and whose weight index was maintained or augmented while they were being fed on laboratory milk. There were 109 cases in this group, or a little more than one-half the entire number. There was a gain of 8 per cent. for this entire group, and the greatest average gain per week was 156 grams reckoned from the lowest average gain attained during treatment.

The second group included those infants who recovered from their symptoms and gained in weight, yet displayed a loss in weight index. There were fifty-eight cases in this group, and the greatest gain per week from the lowest weight attained was 94 grams. The infants in this group were not as long under treatment as those of the first group, the duration of treatment averaging only 5.9 weeks in comparison with an average of 8.5 weeks of treatment given to the infants in Group 1. The gain made in this group was not great enough to keep up the weight indices, so that there was an average loss of 3.4 per cent.

Group three is made up of those infants whose weight did not increase to any great extent, although in general they recovered from the acute symtoms, gastric and intestinal, for which they came under treatment. There were thirty-seven children included in this division. Eleven cases did not improve under treatment, and no further history has been obtainable in eight instances, so that there may have been a fatal outcome in some of them. The average loss in weight in this group from the lowest point attained was 6.5 grams per week, and the loss in weight index 7.2 per cent. The average length of time under treatment was 3.7 weeks.

The fourth group consists of the fatal cases, of which there were twelve, so that the average mortality for the whole number of cases under discussion was 5.6 per cent.

DISTURBANCES CAUSED BY THE EMPLOYMENT OF LARGE FAT PERCENTAGES IN INFANT FEEDING.—It was the opinion of Dr. L. E. Holt of New York that very serious disturbances result from the administration of too great a percentage of fat in the milk selected for infant feeding, even by the most experienced physicians and nurses. A very rich milk, with a percentage of fat often reaching 5 or even 5.5 is often employed in the same manner as an ordinary 4 per cent. fat milk would be used, so that the formula may reach as high as 6 per cent. of fat, instead of 3.5 or 4 as was intended. The speaker reported some cases illustrating the effects of such errors, among which may be noted the sudden and severe character of the illness, enlargement of the liver, convulsions, laryngismus stridulus or tetany, and stools consisting of almost pure fat. There were also nervous symptoms which ceased when the quantity of fat was reduced and returned one week later as soon as it was increased to the former amount. Another case observed developed slight rickets, evidenced by delayed dentition and craniotabes, with convulsions, which returned after an interval of a week when the fat was again increased to almost its original strength. There was also constipation, so that the bowels had to be relieved by magnesia. It was the conclusion of the author that in those cases where there was any disturbance of digestion the best results were obtained by a lower percentage of fat and greater one of proteids, and this is in a measure true of infant feeding in general.

Dr. Charles G. Kerley of New York had not obtained the results noted by the previous speaker and said that he was in the habit of reducing the amount of food administered until the temperature and the stools returned to normal. He then gave a weak formula, with only four or five per cent. of sugar and not more than one-half of one per cent. fat. The children under six months old who had come under his observation in the New York Infant Asylum did well on milk containing only about two per cent. of fat, and seemed to be less liable to intestinal derangements.

It was the opinion of Dr. R. G. Freeman of New York that the working out of the weight index was the most striking feature of Dr. Ladd's paper. Concerning the subject of the second paper, it seemed to him that there was often much confusion in the minds of mothers and nurses as to what high fats consist in. Books on infant feeding often recommend cream, and it is added quite regardless of the fact that it may be 40 per cent. centrifugal cream instead of the ordinary 16 per cent. fat.

Dr. J. Lovett Morse of Boston called attention to the fact that eczema and ammonical urine often resulted from the administration of too much fat.

Dr. B. K. Rachford of Cincinnati desired to find out if autointoxication was the cause of the nervous symptoms often seen as a result of too much fat feeding.

It was the experience of Dr. L. E. Le Fetra of New York that infants prematurely born, and weighing from four to six pounds would often increase in weight with greater rapidity than children born at term, and would triple their birth weight at the end of the first year of life.

Dr. J. E. Winters of New York was of the opinion that it was often not too much fat in the food, but too much food which caused most of the intestinal disturbances under discussion. Infants were often rendered constipated because they were obliged to take far more food than they could well assimilate.

Dr. Holt thought that in cases of summer diarrheas infants were often kept too long from milk. In those cases where there was acute intoxication milk must be withheld until recovery was almost complete, but where there was simply intestinal indigestion resulting from dysentric organisms it was not so imperative.

A CASE OF INFANT CONGENITAL HYPERTROPHIC STENOSIS OF THE PYLORUS was reported by Dr. J. Dorning, of New York. A child weighing eight and one-half pounds was born March

23, 1903. The parents were healthy and labor was natural. The child was fed by the breast exclusively. It vomited after nursing, but the mother said she never noticed mucus in the vomit, that the milk was always returned fluid, and the child seemed to be able to retain water. The bowels moved two or three times a day, the stools being always yellow in color. The child slept very well, and grew tall, but the limbs were always very thin. The case was seen by Dr. Dorning on May 24. The infant was badly nourished, pale and listless, abdomen distended, but not tender, soft and tympanitic. In the epigastric region, just to the right of the median line, a small mass was palpable. The child died on June 7, becoming unconscious while nursing and passing away in two hours. At autopsy the stomach was found to be distended, the pylorus hard and thick, and one inch beyond it the duodenum was deeply congested. There was no ulceration of the gastric mucous membrane, although it was pale in color. There was a decided thickening of the stomach wall in the region of the pylorus. Such a condition, the author said, had now been recorded in the literature about sixty times. A study of these records would lead one to conclude that there might be two distinct pathological conditions with clinical manifestation of a similar nature, one of which is surely fatal unless there is possible relief through operation, and another which may be relieved by proper dietetic measures. It is also possible that these are simply gradations of the same morbid condition. A palpable pylorus, intractable vomiting with no apparent cause and progressive wasting are the symptoms of hypertrophic stenosis of the pylorus. The gastric symptoms are often quite prominent in cases of moderate severity, yet under dietetic treatment may improve or even appear to cease entirely, especially in those cases where muscular spasm is a noticeable factor. If there is no bile in the vomitus, an obstruction above the entrance to the common bile duct might seem to be indicated, but if bile is present it does not necessarily exclude the diagnosis of pyloric stenosis. The diagnosis may be established beyond a reasonable question, however, if, as well as the symptoms before enumerated, a palpable tumor is present in the pyloric region. As it is sometimes difficult to palpate very minute masses in the upper abdominal region, the use of anesthetics may often aid in disclosing the presence of a thickened pylorus which could not be found by the palpating finger. If symptoms of pyloric obstruction are present there is always a strong suspicion of hypertrophic stenosis, for congenital pyloric stenosis displays practically the same ones, and other conditions are so rare in infancy that they may be practically ruled out. All cases do not have the immediately fatal termination of the one cited, and such children often live some time with symptoms of dyspepsia, more or less acutely manifest.

RENAL DECAPSULATION AS A CURE FOR CHRONIC NEPHRITIS.—A case of chronic nephritis in a female child four and a half years old was reported by the President, Dr. Augustus Caillé. The urine contained renal elements, blood, casts, albumin and pus, was dark in color and scanty, fluid was present in the abdomen, and the eyes were puffy. She received hospital treatment consisting of diuretics and diaphoretics, with sweating and intestinal irrigation and was discharged much improved, but nine months later returned to the hospital, when the heart was found to be enlarged and general edema to be present. After a decapsulation of both kidneys had been done a typical chronic parenchymatous nephritis was found on both sides. Both kidneys were three times their normal size and over four inches in length. The patient made an uneventful recovery and there was no return of any of the previous difficulties. The author stated that in cases of this sort he would strongly advise inspection of the kidneys by lumbar incision, in the presence of a chronic nephritis which was not relieved within a reasonable time, that is, if no heart lesion was present. The hope of preventing an acute nephritis from becoming chronic would warrant splitting the capsule or decapsulating one or both kidneys, if they appear enlarged or swollen.

In reply to a question by Dr. Kerley as to what effect such a procedure would have should these children contract scarlet fever or other infectious disease, the author said that as the procedure was a new one little definite data had yet been gathered on these points. Many cases had been operated upon with marked benefit, as in the one reported, but the exact benefit conferred had yet to be determined, as to whether it was on account of increased blood supply or of the massage incident to the handling of the organ. But the results from the operations which he had seen were better than from those from medication.

EPIDEMIC VULVOVAGINITIS IN INFANTS AND CHILDREN.—A paper on this subject was presented by Dr. A. C. Cotton, of Chicago. An epidemic of gonococcus infection occurred in a hospital from August, 1902, to September, 1903, and during this time 319 children were admitted. A urethral discharge was first noted in a boy two years old, on August 8, 1902. Next a girl suffering from typhoid fever was found to have a vulvovaginal discharge containing gonococci. The epidemic would seem to have arisen from these two patients. It was the opinion of the author that every children's hospital should take special precautions against such infection, by maintaining detention wards where new patients may be isolated for at least two weeks to insure their freedom from infectious disease, and should symptoms of any such acute infection develop there should also be completely isolated wards where the patient could be immediately removed, and placed in charge of special attendants who should have no duties in the general wards. The same care should be used in the manipulation and treatment of a gonorrhea case that would be employed in regard to any other infection of an acute nature. Gonorrhea in a children's hospital was much to be dreaded, and female infants seemed to be exceptionally prone to contract it.

Cases of a secondary involvement of the uterus or cervix, or a nephritis or pericarditis had been observed by Dr. Jacobi of New York, but in his opinion it was rather remarkable that undiapered children from two to four years of age did not more often carry infection to the eyelids.

In the Babies' Hospital in New York Dr. Kerley had seen some 20 cases of gonococcal arthritis in two years, and Dr. Jacobi had observed one case where a myositis was present.

Two cases of gonorrheal arthritis had been observed by Dr. L. E. Le Fetra. In a baby three weeks old the source of infection appeared to be from the mother who had gonorrhea at the time of the child's birth. The second case was that of a child eight months old.

Dr. Caillé stated that at present every child admitted to the Post-Graduate Hospital in New York was thoroughly examined and a swab culture made, the child being refused if gonococci were found. This was done on account of the possible danger revealed by a suit brought against the hospital some years ago, when a child admitted in apparently good condition developed a specific vulvovaginitis.

ACUTE SCARLATINAL NEPHRITIS SIMULATED BY CARBOLIC ACID POISONING.—The case of a child ten years old who suffered from an attack of scarlet fever of moderate severity, was reported by Dr. S. S. Adams of Washington. There were no alarming symptoms when he first saw the child on February 3, 1904. He instructed the mother to bathe her twice daily, using one teaspoonful of commercial carbolic acid to a quart of water, to allay the intense itching of which she complained. On visiting the patient ten days later very profuse desquamation had set in, the itching had been relieved by the carbolic acid baths, and there was apparently no tingling or irritation caused by them, so that the patient's condition was excellent He received a report on February 22 that the child was in good condition, but had passed some dark urine, a specimen of which he also received. This specimen contained granular casts, albumin, hyaline and red cells, and on visiting the patient her eyes were observed to be puffy. The baths being stopped the puffiness disappeared and the urine improved. It was Dr. Adams' conclusion that the patient had an idiosyncrasy against carbolic acid, as such a weak solution was employed, but he was satisfied from the urinalysis that the symptoms of nephritis were due to the carbolic and not to the toxic effects of scarlatina, and the quick relief of the kidney irritation when the carbolic was stopped confirmed this.

Gastrointestinal Toxemia.—In a paper on this subject read by Dr. B. K. Rachford of Cincinnati, the author drew a distinction between gastrointestinal intoxication and autointoxication, inasmuch as the first was a systematic intoxication caused by poisons formed and absorbed by the gastrointestinal canal. The bacterial poisons produced in this canal may be caused by the components of dead bacteria, tuberculin for example, furnishing a certain amount of protein, by living bacteria excreting toxins or ferments, that can produce the most severe symptoms, or by substances produced by the bacteria from the culture media. Ptomains are the most important of this latter class. The great irritability and the immaturity of the nervous system of the child or infant would probably account for the greater incidence of acute intestinal toxemia in patients of that age. A quantity of poison easily thrown off by an adult might produce high fever, convulsions and other symptoms of a pronounced nervous type in young children. The fact that the hydrochloric acid function of the stomach is less developed in the child than in the adult may also account for the greater frequency of severe albuminous fermentations, which are able to produce virulent toxins, as the stomach is on that account less able to control and prevent intestinal fermentation. The author wished to especially direct the attention of his audience to chronic intestinal toxemia, as he considered this a most important etiological factor in the production of nervous symptoms, and one to which proper attention is not often directed. Even when constipation exists this form may be associated with diärrhea. The food material should not be retarded, and the feces when ejected should have the moist form of a normal movement, as it is thus hyperfermentation and increased absorption of the poisons in the intestines may be prevented. The author regarded intestinal intoxication as so important a factor in the production of nervous symptoms in children, that he nearly always began his treatment of such affections by making a thorough examination into the condition of the intestinal canal. He mentioned hyperesthesia, psychoses, nervous anxiety, hysterical and neurasthenic symptoms, bradycardia, general nervous irritability, fever, malaise, heightened reflexes and anemia as symptoms which might be produced or increased by intestinal toxemia. The presence of indican and the ethereal salts in the urine offered valuable clinical confirmation of the diagnosis. Because of the general tendency to attach so great importance to vegetable organisms in the production of intestinal toxemia the part played by animal parasites is often overlooked.

Dr. Jacobi mentioned the eating of raw vegetables, as in Germany and other European countries as likely to produce such symptoms, and also spoke of the practice of the old textbooks in ascribing them to "worms." He had also thought that a protracted anemia might cause disturbances of digestion by creating an insufficiency of gastric and pancreatic juices.

It was the opinion of Dr. Forchheimer of Chicago that the finding of indican in the urine was unimportant. He spoke of the retention of feces being followed by diarrhea in children, and he drew particular attention to a condition he had already described, occurring more often in adults than in children, a chronic ulcerative stomatitis, taking the form of Riggs' disease in adults. In Riggs' disease he had always found uric acid and thought it caused by some autointoxication.

Dr. Rachford thought that the presence of indican in the urine bore a relationship to that of indol in the intestine, indol being one of the results of putrefaction, and formed in the intestinal canal by hyperfermentation.

FIFTY-ONE CASES OF ACUTE OTITIS IN CHILDREN.—This series of cases was from the private practice of Dr. Charles G. Kerley of New York and was illustrated by several temperature charts.

TUESDAY, MAY 31: SECOND DAY

NERVOUS EXHAUSTION IN INFANTS.—A paper was read by Dr. William P. Northrup of New York on several cases of nervous exhaustion in young infants which condition was the result of too great excitement from the attentions of admiring friends and relatives whose desire to "show off the baby" had often a most unfortunate effect upon the infant. He emphasized the necessity of quiet surroundings for young children, which are desirable particularly before and after the times of feeding, and called attention to the fact that injudicious attention on the part of "grown up people" is often responsible for nervous dyspepsia, sleeplessness and exhaustion in the over-petted baby.

PRESIDENT'S ADDRESS.—Dr. Augustus Caillé chose for the subject of his presidential address the benefits conferred upon the children of America by the American Pediatric Society, and the objects toward which, in his opinion, the Society might well direct its future efforts. Among the points which he deemed especially worthy of the attention of pediatricians he mentioned the popular fear of "catching cold," which prevented many homes from receiving their proper share of fresh air. It is the duty of the physician to impress upon parents and those having children in their care the necessity of proper ventilation and temperature. The modern steam-heated dwelling was often heated to a temperature far higher than it should be, and children living under such conditions are peculiarly liable to take cold. He recommended cold bathing and proper feeding with plenty of fresh air, as the surest method of combatting these tendencies. The duties of physicians in connection with disinfection after contagious diseases he regarded as most imperative, and often neglected or improperly performed. Infection is most easily conveyed among children, and such sources as the books of schools and libraries are all too often entirely neglected. Children recovering from such infections as diphtheria were compelled to stay indoors until all bacilli had disappeared from the throat, and they were thus deprived of the tonic effect of fresh air which they greatly need. He regarded this practice as unreasonable and not founded on positive proof. He was also opposed to compelling the removal of children affected with the ordinary eruptive fevers to hospitals, as parents fearing this were in consequence impelled to conceal the existence of such diseases, and the danger of infection thereby greatly increased. He also made reference to the successful campaign which has been waged in favor of the medical inspection of public school children. The primary object of such inspection has been to detect the existence of contagious diseases, but its field of usefulness can still be vastly enlarged. It has already revealed many unsanitary conditions in all kinds of educational institutions, and has aided in the detection of skin lesions, parasites and so forth, but it should be extended to include a sort of hygienic guardianship of all school children. Children abnormal from any cause should be placed under the conditions demanded by their individual needs, and a great work lies before the physicians of America in aiding backward and neurotic children to advance under conditions suited to enable them to keep pace with normal children in perfect health. Such children should have separate class rooms, and receive special care and instruction. The increased efficiency of the next generation would more than repay the extra expense involved.

In regard to children in good health it was the recommendation of the speaker that increased attention be given to the subject of the bodily training of school pupils, and he regarded the playground as being of equal importance with the school room. Personal cleanliness should be one of the first principles inculcated, the foundation of the education of every child, and too much attention could not well be devoted to it.

Regarding children's hospitals, it was his opinion that the physician's duty was not to encourage the crowding of cases of minor ailments or chronic affections into such institutions. Hospital life was highly detrimental to a child. In the New York Post-Graduate Hospital regulations had been drawn up for the prevention of house infection in the babies' ward. They are as follows:

1. Strict cleanliness of premises and inmates. 2. Thorough ventilation. 3. Plenty of air space. 4. No overcrowding of the wards. 5. Feeding of infants by a different hand than that attending to the toilet. 6. Immediate removal and disinfection of soiled linen. 7. The toning up of feeble children by a change of air, or a sojourn in the roof garden or sunbeam playroom.

The speaker then took up the consideration of the advances possible in the education of pediatricians. For undergraduate instruction he favored didactic lectures and bedside demonstration, and a strictly clinical basis for post-graduate work. The prominent features of a course in pediatrics should be dietotherapy and hydrotherapy, with physical diagnosis and laboratory work. His own plan of instruction for many years had been to devote two-thirds of the clinic hour to the demonstration on a number of sick children so placed as to be readily accessible to the students, and the last part of the time to the discussion of important principles of treatment in the most common affections, or practical demonstration of such operations as tracheotomy, bowel irrigation, intubation or spinal puncture.

Summing up the suggestions made in the address Dr. Caillé offered the following set of headings, under which material might be gathered from year to year and presented in the transactions of the Society, thus making a running record of the world's progress in pediatrics. At each annual meeting the Council might appoint certain members who would be expected to furnish a critical review for the next meeting. The headings were (1) Home, school and hospital hygiene and prophylaxis. (2) Methods of teaching pediatrics. (3) Chemical, bacteriological and regional diagnosis. (4) General therapeutics, such as nutrition, diet, hydrotherapy, electrotherapy and phototherapy. (5) Surgical therapeutics, orthopedics and mechanotherapy.

LOBAR PNEUMONIA OCCURRING IN 118 CASES IN INFANCY.—These cases were presented by Dr. J. L. Morse of Boston. It was his opinion that lobar pneumonia occurs more frequently in infants than is commonly supposed to be the case. In analyzing his cases he had observed that the onset was not as violent as one would generally suppose, usually beginning with fever and a cough, often with vomiting, but not frequently with a convulsion. The patient was often apathetic and drowsy. He had found that the left lower lobe was the one most often involved, next in frequency being the right upper and right lower lobes, and the entire lobe was more often involved than a part. The involved area was usually larger in the fatal cases than in those who recovered, but the part involved seemed to be about the same. 12.8 days was the average duration of fever in the cases that were uncomplicated, but had a fatal outcome; eight days was about the average of those cases who recovered. The highest temperature ranged from 103 degrees F. to 106 degrees F. Crisis was more common in the second year of life than in the first, and the temperature fell by crisis in more than half the cases. Remissions and irregularities of temperature occurred very often, but pseudo-crisis was very uncommon, as was also collapse during the crisis. No patient died whose respirations were lower than 55, but the usual rate was between 55 and 80, and even when above 55 the respiratory rate seemed to have no effect upon the mortality. The rate of pulse varied from 150 to 170. In nearly one-fifth of the cases there was complicating otitis media, and empyema was a complication in about 8 per cent. of the cases. The age of the patient and the amount of lung involved greatly influenced the prognosis, as the mortality was almost twice as great in the first year of life than in the second. If the temperature did not rise above 103 degrees F., the pulse above 140 or the respiration over 55, the prognosis was good, but above these limitations it became grave, and the amount of increase seemed to have little influence on the chances of a fatal outcome.

Dr. F. S. Churchill of Chicago told of the case of a baby of two months who was attacked by pneumonia, the culture showing the pneumococcus and the smear the influenza bacillus. Although the infant survived the first attack, another, six weeks later terminated fatally, but the second time the culture did not show any influenza bacilli. As the combination of these two infections is usually fatal in adult cases it was remarkable that an infant should have survived in the first instance. It was Dr. Churchill's belief that lobar pneumonia is more common in infants than is ordinarily supposed to be the case, and that its presence is often overlooked by careless examiners.

Dr. L. E. Holt of New York had found the left lobe only affected in a series of 16 cases, and it was his experience that providing the infant had been in good physical condition up to the time of the onset of the disease, the prognosis was good, if but one lobe were involved, and the pulse, temperature and respiration did not matter so much.

Dr. S. S. Adams thought the mortality rate mentioned was too high, as his private experience had been that death occurred only in about ten per cent. of cases. He advised baths only in the most extreme cases.

Dr. W. P. Northrup declared that in a few years fresh wholesome air and plenty of it would be used as a stimulant and antipyretic.

Dr. Morse stated in closing that he had especially wished to emphasize the fact that lobar pneumonia in infants was far more common than was ordinarily supposed, and to call attention to the fact that the rapidity of the pulse rate and respiration were not always dangerous indications.

INFANT ACUTE PYELITIS.—Dr. R. G. Freeman of New York said that the acute pyelitis of infancy was sufficiently rare to pass unnoticed for a number of weeks, because the profession generally was unfamiliar with its manifestations, on account of the absence of local symptoms indicating the location of the disease. Female children appeared to be the most frequent victims, and infection from the genitourinary tract seemed likely, although the fact that many cases come on after intestinal disturbances, and the frequent association of the bacilli coli communis, would lead one to suspect infection from the alimentary tract. No evidence that the pelvis of the kidney was the location of the difficulty is given by the clinical manifestations. There are usually abnormal movements of the bowels, high temperature with marked remissions, sometimes accompanied by chills. Because it is a rather difficult matter to secure satisfactory urinal specimens from babies, he believed that this diagnostic method was too often neglected. Treatment was easy and harmless, consisting of neutralization of the urine. He reported the case of a male infant who gave some evidences of urethral irritation at the commencement of the attack, which had been preceded for several weeks by mild digestive disturbance. The attack lasted for three weeks, the temperature being irregular and very high toward the last, associated with nervous symptoms. Treatment was instituted on the twenty-second day of the attack, and the child made a complete recovery in eight days, remaining perfectly healthy.

Dr. J. L. Morse said he had had no trouble in obtaining specimens of babies' urine for examination. In the hospital in Boston where he had gone on service the examination of the babies' urine was made a routine practice, and there were almost always some cases of acute pyelitis among the infants under treatment there, from which circumstance he judged that the frequency with which we meet this condition depends largely upon how often the urine is examined. If pus were found it was sometimes hard to tell whether it came from the kidneys or the bladder; if he saw spindle and caudate cells he referred the trouble to the kidney, if squamous cells were present it was probably in the bladder. It was of course, a new field of investigation, but in his opinion nearly all cases were due to a colon bacillus. He had twice found tubercle bacilli in the urine, although tuberculosis was present in the kidney, and no where else.

Dr. Isaac A. Abt of Chicago reported a case of acute pyelitis where the Shiga bacillus was discovered in the urine. This would also open up a new field of investigation, as to whether this bacillus could be found in the urine.

Acute Myocardial Insufficiency in Certain Diseases of Children.—Dr. F. Forchheimer of Cincinnati said that a large number of acute myocardial insufficiencies developed in connection with the infections of childhood, and setting aside the possible fatal termination, there was the consideration of the lasting effects upon those children who survived. There were cases where such damage was done to the heart, as to permanently impair its function, although this condition might not be discovered until some extraordinary call was made upon it. The involvement of the myocardium was a fact now accepted by all in every case of pericarditis or endocarditis, from which it could be seen how very likely acute myocardial insufficiency was to develop. The first symptom to be noted was usually a diminution in heart force and arrhythmia, next dilatation, first of the left heart, then of the right, with insufficiency of their respective valves. Noticeable increase in the size of the liver follows the serious affection of the right heart. The author had seen cases where the liver descended to the level of the umbilicus. Weakness, tachycardia or bradycardia, irregularity of heart and pulse impulse, a broadening of the heart dulness, and bruits, most commonly over the mitral and the tricuspid areas and the apex, but sometimes also over the base, he regarded as the most usual symptoms. Among the acute affections he thought diphtheria most liable to cause myocardial insufficiency, generally making its appearance about the second or third week. Heart death in diphtheria is not always caused by pure myocarditis, at least two other processes may complicate it. The diphtheria toxin may affect the vasomotor centers resulting in dilation of the blood vessels, and retarding the proper propulsion of the blood, or, as it has been perfectly established that in diphtheria the vagus is often affected, this affection of the vagus may give rise to arrhythmia. Second to diphtheria, the author had experienced the septicemia of influenza, as a frequent cause of myocardial insufficiency. He had observed some cardiac changes in all the cases which had come to his attention.

Absolute rest was the first principle in the treatment of uncomplicated myocardial insufficiency. Predisposing causes must be controlled, and convalescence should be under most careful observation. If laxatives are needed those of violent action should be avoided, but strychnine and the digitalis group of drugs might be used depending on the amount of myocardium affected, while stimulants might also be indicated. In his own experience he had been able to reduce the pulse rate of one child from 140 to 60 by means of ice bags upon the abdomen to stimulate the splanchnic reflex, and saline transfusions in the beginning, to keep up the heart's contractions, with hypodermic injections of adrenal extract repeated every two hours. Except in the case of angina attacks nitroglycerin should never be employed. After the most acute symptoms had passed it was the author's custom to administer sodium salicylate and caffeine, alternating every two hours with the adrenal extract which was thus gradually withdrawn.

Dr. Jacobi stated that it was only since Engelman of Boston had shown the importance of the heart muscle aside from the influence of the nervous system that the necessity of studying the myocardium and its diseases had been generally recognized by physicians. It was an acknowledged fact that a myocarditis, an endocarditis and a pericarditis might all three exist at once. Sometimes one comes in contact with an old cicatricial condition, but there are two forms of the condition, real interstitial inflammation and a parenchymatous degeneration manifesting itself under varying forms. He advised strongly against the use of digitalis as causing contraction, not only of the heart, but of the arteries as well. He usually relied in such cases upon opiates such as codeine, and also made use of the iodides, and the application of ice bags.

Dr. Forchheimer stated in closing that his object had been to advocate some definite form of treatment in both chronic and acute myocarditis, and that he had endeavored to present two clinical pictures, one where myocardial insufficiency was due to a simple myocarditis and the other where it occurred as a complication.

WEDNESDAY, JUNE 1: THIRD DAY

FORTY-THREE CASES OF ASTHMA IN INFANTS AND CHILDREN.—The analysis of 43 cases of asthma occurring in children under twelve was presented by Dr. L. E. Le Fetra of New York. Divided according to the age of occurrence, eleven patients were under one year old, eight between one and two years, nine from two to five years, and fifteen from five to twelve years of age. The histories given were not sufficiently reliable to be of use for statistical purposes, but family history of asthma, rheumatism, tuberculosis or nervous affections was obtained in most instances. There were no Italians, and only two negroes among the patients studied, which the author regarded as peculiar, as one would naturally suppose that rickets would be an important predisposing factor, as is usual in the case of bronchitis and spasmodic croup. Rickets had been present in only eight cases, according to the history given. Two of the children had been born prematurely, 20 had had bronchitis, seven broncho-pneumonia; one had had chorea, and there were two cases each of atelectasis and enlarged thymus gland. In fourteen cases bronchitis had been the cause of the attack, in two it was after pneumonia, and other cases were the result of a fall, an attack of malaria, a drive in a cold wind, a gastric indigestion, etc. The periods covered by the attacks varied from "every winter" or "every summer" to those of daily occurrence. There were but three cases which were distinctly worse in summer, and in only two were the attacks more severe by day. There was emphysema associated with asthma in ten cases, five of whom had the square or barrel chest. Nearly fifty per cent. of all the patients had adenoid growths, which the author regarded as significant. In 20 cases adenoids were associated with enlarged tonsils and one had a congenitally high arched palate without adenoids.

There are few difficulties in making a diagnosis of asthma, if it is borne in mind that children are subject to it. The speedy recovery with recurrences, and the increased number of eosinophiles shown by a differential count would easily confirm it. He considered a differential count of leucocytes to be also of value. The peculiar type of breathing was induced by a narrowing of the lumen of the bronchial tubes, but there were two theories in regard to the cause of this, namely, spasm of the smooth muscle fibers of the smaller and medium sized bronchial tubes, and vasomotor tumefaction or paresis, a sort of angioneurotic edema or urticaria of the bronchial mucous membrane.

The proper treatment could usualy be inaugurated after a careful study of the history and influences surrounding the patient. Such conditions as nasopharyngitis, bronchitis or adenoids should be considered as predisposing factors and receive careful attention. All predisposing or exciting causes should be recognized and removed. Diet and hygiene were important considerations as the general condition should be toned up as much as possible, and such measures as cold bathing, open air exercise, and abundant ventilation day and night were very effective. Regarding medication, in cases of long standing or for the subacute he favored iodide of potassium. Steam impregnated with creosote he had found very useful for inhalation in the case of infants, when the attack closely resembled capillary bronchitis. If the child could swallow he gave ipecac and tartar emetic, together with nitroglycerin. He had also had success in the administration of atropine until the face flushed. If there were evidences of gastric indigestion syrup of ipecac might be used to empty the stomach, which should be done without delay. In older children he had successfully used the old mixture containing morphine sulphate, belladonna and compound spirit of ether. If the attack is due to vasomotor paresis, in accordance with this theory vasoconstrictors might be given. He had found suprarenal preparation very useful in certain instances.

Central, Peripheral and Obstructive Dyspnea.—Dr. W. P. Northrup of New York mentioned three types of dyspnea, first that of peripheral origin, neuritis, probably diphtheritic and paralysis of the diaphragm; second that of central origin, infectious transverse myelitis and paralysis of the thoracic muscles of respiration, and lastly the obstructive type, due to the accidental pressure of the air in the thorax, perhaps on account of faulty exploration by the needle, not resulting from obstruction of the larynx or naso-pharynx.

Dr. C. G. Jennings spoke of a very interesting case reported by him at the Boston meeting. The clinical picture was at first that of attacks of coma, but this soon changed and asthma set in. The case was one of autointoxication.

Dr. Holt was of the opinion that the only reliable remedy for asthma in a child was a change of climate. He recommended improving the general condition of such children by the use of tonics as cod liver oil and iron, and keeping them in the open air as much as possible. Attacks of asthma were very apt to follow whooping-cough or measles.

Dr. Abt spoke of the dangers of unskillful aspiration of the chest, and Dr. Caillé said he had seen pneumothorax occur twice as the result of such explorations.

Acute Leukemia.—This was the title of a paper presented by Dr. F. S. Churchill of Chicago. He stated that nothing could be regarded as a cause predisposing to this affection except possibly tonsillitis, and this might as well be an effect as a cause. The disease was not peculiar to children, and it ran the same course with them as with adults. Its duration was sometimes as brief as four or five days, or on the other hand it might last five months. There was invariably enlargement of the spleen, although it was not uncommon to see this organ diminish in size just before death. The blood examination was the chief point of interest. The hemoglobin and the number of erythrocytes were diminished, and the number of leucocytes ran from 6,000 to 810,000. Approaching death was denoted by a falling white count. There was a marked decrease in the number of polymorphonuclears, and almost no myelocytes. The blood tended to turn to the fatal type, but only one case in 29 presented a hemorrhage. The differential count offered the only means of making an accurate diagnosis in leukemia. A fall in leucocytes was almost always the effect of an intercurrent disease. The true nature of leukemia is unknown and all treatment was unavailing. Believing that the disease was malignant in nature some had tried the spray, but with no good result, but bacterial examination failed to give any ground for this view. He regarded any treatment as justifiable in such an obscure and fatal disease, however, and thought that serum injections seemed to offer the most hopeful indications. As twenty-nine cases had been recorded he regarded it as more common that is generally supposed.

PRIMARY SARCOMA OF THE LIVER.—A case of adenosarcoma of the liver in an infant was reported by Dr. L. Emmett Holt of New York. The child was poorly nourished, and on the right side of the abdomen a large tumor was palpable, filling the entire half and extending beyond the umbilicus and down into the pelvis. The tumor was smooth surfaced, soft and distinctly outlined. Further examination was negative. There was a temperature varying between 100 degrees F. and 102 degrees F. A puncture of the liver was made under the supposition that an abscess might be present, and a bloody fluid withdrawn, with liver cells and fatty droplets, but no pus was obtained. The surgeon called in made an incision under cocaine anesthesia, and came upon a mass of broken down material, into which a drainage tube was inserted. The child died of exhaustion two weeks later and at autopsy the liver was found to be 19 cm. long and 21 cm. wide, weighing 735 grams. No peritonitis or thickening was noticeable. Adenoma with sarcomatous degeneration in the center was revealed under the microscope. No metastases were found, but a bronchopneumonia and a pericarditis were discovered. Only two other cases in children have been so far reported.

RADIOGRAPH OF A THORACO-ABDOMINOPAGUS.—This was presented by Dr. Samuel S. Adams of Washington, the monster having come under the observation of Dr. H. B. Sheffeld.

ELECTION OF OFFICERS.—The following officers were elected for the ensuing year: President, Dr. Charles G. Jennings, Detroit; First Vice-President, Dr. Charles G. Kerley, New York; Second Vice-President, Dr. J. Park West, Bellaire, Ohio; Secretary, Dr. Samuel S. Adams, Washington; Treasurer, Dr. J. Park West, Bellaire, Ohio; Recorder and Auditor, Dr. L. E. La Fetra, New York.

PHILADELPHIA PEDIATRIC SOCIETY

Stated Meeting, Tuesday, June 14, 1904

The President, Dr. J. H. Jopson, in the Chair

Microcephalic Idiocy.—Dr. Alfred Hand and Dr. S. S. Woody presented a case of microcephalic idiocy. The patient was a female, four years and one-half old. An older brother had died at the age of nine years, of tuberculous meningitis. A few years before the birth of the patient, the mother had a miscarriage at five months. Two months before the patient was born, the mother fell from an open trolley-car. The child weighed seven pounds, two ounces, at birth. Her present weight is eighteen pounds. She was fed at the breast for fourteen months, and was able to sit alone at the age of twenty-one months. At that time, she was able to say "Mama" and "Papa," but has now lost this accomplishment. While her height, 82'6 cm., is about that for a child of two years, her weight is below the normal for one year; and the measurements of the head are less than those for six months of age. The knee-jerks are exaggerated, and the arms are moved with apparent spasticity. The fontanels are closed. The child is able to get around by holding on to the furniture, but cannot stand alone.

Dr. Hand, in discussing the etiology, said that the condition was probably the result of some intra-uterine pathologic process; but that the history of a previous miscarriage should prevent too much importance being attached to the fall.

Icterus Purpura.—Dr. James Ely Talley reported a case of icterus with purpura and persistent hemorrhage from a blood-lancet wound. The child's family history was interesting, because it was the fifth child, all the children having been born within a little less than six years; and because, while the first three children are healthy, the second had a marked icterus during the first few weeks of life, and the fourth died on the third day, apparently with obstructive jaundice. The fifth child was born September 15, 1903, without difficulty. It at once developed jaundice, which became intense. There was no evidence of local infection, and the child had no fever. On the tenth day, purpuric spots developed, and gradually spread widely over the whole surface, some being large and associated with marked extravasation. This continued until the child was a month old, when Dr. Griffith saw the patient. It was decided to risk a blood-examination, which was carried out by Dr. C. Y. White, a small puncture being made with an ordinary blood-lancet, in the left great toe. The puncture-wound persistently oozed; the application of alcohol, collodion, and adrenalin not having influenced this oozing, it was decided to apply a rubber-band tightly for a few hours. This checked the bleeding, but the band was not removed at the time designated. The following morning, the toe was much swollen; and the same day there developed an annular vesicle around the whole toe, just where the rubber band had been. The tension in the vesicle became extreme, and constricted the toe dangerously. It was punctured with a needle, and the serum escaped under great pressure. The lancet-puncture began to ooze again. The vesicle filled with serum and blood, the latter coagulating and making a tense ring around the toe. The needle-puncture also oozed constantly. A large number of remedies were tried without any effect upon the oozing, until finally calcium chloride was given internally. Within forty-eight hours after this, the hemorrhage ceased, having persisted, in all, for a week. A day or so later, the vesicle, with the clot and the toe-nail, came away with the dressing; but there was no return of hemorrhage. Suprarenal extract seemed to control the formation of petechiæ. The jaundice was at the time much improved, and the child gained constantly in general condition afterward. By November 11 it was noted that the jaundice had entirely disappeared; and after this, the baby gained weight rapidly, the spots quickly disappearing. Examination of the blood, made October 18, by Dr. White, showed 28 per cent, hemoglobin, 2,420,000 erythrocytes, and 18,240 leukocytes. The differential count of the erythrocytes showed: polymorphonuclear, 38.4 per cent.; mononuclear, 3.1 per cent.; transitional, 12.4 per cent.; lymphocytes, 41.7 per cent.; and eosinophiles, 4.4 per cent. A small number of normoblasts were present; also polychromatophilic and basic granulated cells, the latter being less numerous than the former. Most of the cells were pale. Poikilocytosis and anisocytosis were not marked. No parasites were seen. Examination of the urine had been negative, except for the presence of bile. The hemorrhagic tendency in the patient was evidently toxic, and dependent upon the jaundice. The cause of the jaundice is obscure. Dr. Talley emphasized the fact that one may well be chary of making even a puncture for a blood-examination in purpuric conditions, especially in children.

General Edema in Marasmus.—Dr. Talley also reported a case of general edema in marasmus. The child, which was a male five months old, of Hebrew parentage, had been fed for a few weeks on the breast, and then with various forms of food. When first seen, it was unable to take milk at all, even when predigested, retaining only albumin-water and barley-water. A few days later, there was puffiness under the eyes. The surface in general then swelled; and after a week, the child appared twice its natural size, from diffuse anasarca. During this time, a small specimen of urine was obtained, and showed absolutely no abnormalities. The baby died in convulsions about ten days from the beginning of the dropsy.

Dr. J. P. Crozer Griffith said that he had seen both cases with Dr. Talley; and that, while both had been intensely interesting, they had been very puzzling as to their exact nature. The family-history in the first case, with the very characteristic complex of symptoms, indicates to his mind, he said, the probability of some congenital obstruction somewhere in the course of the bile-ducts. He mentioned an article in a recent number of an English journal, which seems to show that a more or less complete obliteration of the bile-passages may occur in the small passages within the liver itself. This may be temporary, or may be compensated for later. Dr. Griffith mentioned a case of complete obliteration of the main bile-duct that he had recently seen at the University Hospital. This, of course, was a different condition, and one certain to end fatally.

As to the other case, the diagnosis was very obscure. One occasionally sees in infants curious edemas without evident cause. Dr. Griffith mentioned, also, some remarkable cases of widespread effusion into the serous cavities seen by him, in which the cause was not evident, and in which recovery was complete. In marasmic children, one frequently sees edema of the hands, feet and face; and a more exclusive edema is even more common in scurvy; but Dr. Griffith said that he had never seen edema such as that presented by this infant, except when due to Bright's disease. The cause can only be surmised. The case is similar to the interesting cases, often reported in medical literature, in which there is unexplainable edema. These cases sometimes seemingly appear in epidemics.

Dr. L. J. Hammond referred to the fact that it is generally admitted by surgeons, that the cause of lack of coagulability of the blood in icterus is not the blocking of the bile, with its accompanying jaundice; but the obstruction of the duct of Wirsung, shutting off the pancreatic fluid, as well as the bile. In the absence of structural change, as shown by the results of treatment in this case, the obstruction should be looked for lower down. Dr. Hammond therefore suggested that the jaundice might have been due to a plug of mucus in the common duct, at the ampulla of Vater; or to the edematous obstruction from infection.

Dr. Talley said that some such cause might have been active, but he thought it possible only to speculate as to the exact cause of the jaundice. The case of edema he considered particularly interesting as an example of the incorrectness of the older teaching that the edema of advanced marasmus is due to nephritis. This is certainly not true in many cases, and there are now on record a number of autopsies in which nephritis has been shown to have been absent.

TETANY WITH CONTRACTURES.—Dr. Eleanor C. Jones reported a case of tetany in an infant, with persistent contractures. It was noted that it has been a much mooted question whether cases in which there is persistent bilateral contracture should be included under the term tetany, or this term should be reserved for cases that show marked intermission in the spasms. A number of American authorities that consider cases like the one reported to be tetany were quoted. All writers agree that the diagnostic features of the disease are bilateral spasms limited to certain groups of muscles, chiefly those of the upper and lower extremities; the absence of unconsciousness; and the continuance of the spasms during sleep. Chvostek's symptom, Trousseau's phenomenon, and the electrical excitability of the nerves described by Erb, are not invariably present; but if they are all present, there is no room to doubt the diagnosis.

The case reported occurred in a marasmic, rachitic infant, nine months old. For over six weeks its attitude was as follows:—The hands were tightly clenched over the thumbs, and were flexed at right angles at the wrist and turned toward the ulnar side. The elbows and shoulders were held fixed; the feet were extended; and the toes curled under, the dorsum of the foot being arched. The knees and hips were rigid, the legs being bent on the thighs, and the thighs on the abdomen. The thighs were also adducted so markedly that they crossed each other. The head was drawn back rigidly. The muscles of the angle of the mouth were retracted. Chvostek's symptom was present. The knee-jerks were increased. The child died in general convulsions over six weeks after the beginning of the contractures. The autopsy showed broncho-pneumonia of both lower lobes. The liver, the spleen, and the kidneys were all large and soft.

Dr. D. J. Milton Miller said that the case is interesting as affording a striking example of a condition rare in this country, and because it exhibits both of the most important etiologic factors, viz., rickets and gastrointestinal disturbance.

Dr. Griffith said that, from the description, the case seemed to be a typical one and to be very interesting, particularly in its unusual duration. He has seen only two cases that lasted as long. One presented for a long time persistent contracture at the knees, which was of obscure nature and had been supposed to be due to contraction of the tendon, until the child developed other signs of tetany. The contraction at the knees disappeared in the meantime. Dr. Griffith believes that tetany is increasing in this country. More cases are certainly being reported; and although this may be due to the fact that the disorder is now being looked for more commonly, it seems to him more likely that it is actually increasing in frequency. The disease is closely related to rickets, which is certainly more common here than formerly.

Dr. Horace Carncross remarked that the case is of interest also in another point: that the child was a girl. In infants, boys are more commonly affected; while later in life, women are more frequently attacked than are men.

Dr. Robert N. Willson referred to a recent case in a nurse thirty years of age, who had an entirely negative previous history; and who, after having eaten lobster and sauerkraut, had an attack of colic that was followed by typical spasms in the hands and feet. These spasms lasted for a few hours and then disappeared entirely.

Dr. Jones, in closing, expressed herself as pleased that the diagnosis had not been questioned, as she had thought possible.

EDITORIAL

SERUM THERAPY IN SCARLET FEVER

Until the true causative factors of scarlet fever are found it is not unlikely that attempts at specific medication will be haphazard, and for the most part abortive.

In recent years the trend of thought has rested on the streptococcus as the chief criminal, and since bacteriologists have not been able to establish definite species limitations between different closely related forms of streptococcus, or have only succeeded in making general group distinctions between the many streptococci, the attempt has been made to bait several hooks on the line in the hopes of catching the fish, with the result of the manufacture of so-called polyvalent serums, or serums made by the use of several strains of streptococci.

These polyvalent serums have been many; at first they were produced in animals by the use of mixed cultures of streptococci in general; then the mixed cultures were of organisms isolated exclusively from scarlatinal patients. The sera of Roux and Tavel, Aronson and Moser were among the most valuable of those produced by the application of this general idea.

It is impossible at this time to make comparisons. Sommerfeld (*Centralblatt f. Bakteriologie,* April 22, 1902), it is true, attempted to show wherein these sera differed, but to those who are not captivated by the seeming mathematical accuracy of serum methods, particularly when the results of such methods seem to be biased by commercialism, the logical attitude would seem to be to keep on trying until relative truth is attained. The present commercial method of proving that the rival manufacturers' serum is worthless, does not gain favor in truly scientific circles, and usually places the reporter where he belongs.

We cannot escape the fact at the present time that commercial houses must manufacture these agents. The horses, glassware, bottling, labeling, bacteriological apparatus, etc., etc., required to manufacture these products in the necessary manner, demand an enormous outlay of money, but the reports that come from workers in all parts of the world must each be taken as a part of the whole. There are many pseudo scientists, "made in Germany," as well as here, the great haven of quackery.

We are tempted to make these general remarks in going over an excellent paper, possessing the earmarks of sincerity, by Dr. H. L. K. Shaw, on the use of the Moser Antistreptococcic Serum (*Medical News,* October 29, 1904) for the treatment of scarlet fever.

Moser's cultures of streptococci, derived from his severe scarlet fever patients, now number at least thirty, and as these are all used in his injections in the horse, it is claimed that he has a highly polyvalent serum. With this serum Shaw reports his having seen such excellent results that one is almost convinced that it is the most valuable thus far manufactured. Yet, as already pointed out, Sommerfeld has stated that Moser's serum was a weak product when compared with Aronson's.

As to practical deductions we cannot feel that the problem of specific therapy in scarlatina has been solved by any of these sera. From the clinical evidence, however, there is little doubt that the three serums mentioned have some therapeutic efficiency. They are certainly worth using in grave cases, but El Dorado is not yet in sight.

ABSTRACTS

Polymyositis and Polyneuritis in Measles.—DR. JESSEN and DR. EDENS (Berlin. klin. Woch., Aug. 8, p. 847) report these cases. (1) POLYMYOSITIS.—A woman, aged thirty-two, became ill on July 26, 1902. Details of the first 4 days of the illness are not known. On July 30, at 10 p.m., the temperature was 101.3 degrees F., the pulse was 120, and there were cough, harsh respiration, and constipation. She had been given aspirin, cocaine, quinine, and hydrochloric acid with pepsin. On July 31 the temperature was 106.1 degrees F. A typical measles eruption appeared with swelling and redness of the eyelids. When this was fully developed the temperature gradually fell and became subnormal on the evening of Aug. 2. On Aug. 10 pains appeared in the lower limbs. They appeared to be due to a combination of muscular and articular rheumatism. With aspirin, profuse perspiration, and the application of an ointment of turpentine and salicylic acid the paid temporarily subsided, but soon returned. The patient appeared to be nervous and neurotic. She was admitted to hospital on Aug. 14.

She was pale and the temperature was 99.6 degrees F. The viscera were normal, and the spleen was not palpable. There was edema of the dorsum of the left foot, and the whole lower limb was extremely tender. The epidermis could be removed in large flakes as after scarlet fever, and there was slight desquamation of other parts. The joints were normal. But active and, to a less extent, passive movements were greatly restricted, and produced intense pain in the muscles. Possibly there was some cutaneous hyperesthesia. Profuse perspiration continued after aspirin was discontinued. On Aug. 19 the edema of the left foot had almost subsided and the pain was less, so that the leg could be moved practically normally. She was apyretic and felt well except for severe diarrhea which had continued for 2 days. On Aug. 21 considerable pain appeared in the right leg, and the evening temperature was 100.4 degrees F. The whole right lower limb swollen, except the region of the knee. The muscular layer of the thigh was thickened and in places of wooden hardness. The skin was tense and, over the thigh, was shiny; it was of a bluish and in places a deep blue color. The right thigh measured about 4 in. more than the left in circumference. The muscles of the calf were especially hard, and were readily felt through the soft, somewhat tense skin. The right calf measured 2 2-5 in. more than the left. On Aug. 23 the muscular swelling and tenderness persisted unchanged and the skin was slightly edematous. The inguinal and popliteal regions were especially tender. The joints were unaffected. The knee-jerks were present on either side. On Aug. 26 the edema of the skin had increased and the swelling of the muscles had diminished. An attack of cardiac palpitation occurred. On Aug. 29 the muscular swelling was rapidly subsiding, and the right calf in the recumbent position was perfectly flaccid. On Sept. 3 the cutaneous edema had almost subsided except on the right ankle and dorsum of the foot. On Sept. 5 attempts at walking were followed by extreme edema of the feet. On the evening of Sept. 6 a rise of temperature above 100.4 dgrees F. was preceded by violent pain in the left thigh. Unlike what was observed in the attack in the right leg, the pain and swelling were confined to certain groups of muscles, especially the adductors, which were of wooden hardness. Active movements were impossible and passive were greatly restricted through pain. The morning temperature was usually 98.6 degrees F. and the evening 101.3 degrees F. The swelling spread from the thigh to the inner side of the upper third of the left leg. There was great prostration. From Sept. 13 onwards the temperature was normal. On Sept. 14 the swelling and pain in the left thigh had almost subsided. The bluish discoloration of the skin seen in the right leg was scarcely perceptible in the left. On Sept. 19 movements of the left leg were almost normal, the edema had disappeared, and the general condition was improving. On Sept. 22 the legs were normal and she could walk well except for general weakness. The urine was free from albumin, sugar, and indican. In Feb., 1903, she was well, but the legs were always slightly swollen and small blue spots were said to be present in the skin of the ankles.

This is a typical case of acute polymyositis, though the splenic enlargement and affection of the mucous membranes which are sometimes found (Review, Vol. VI, p. 587) were absent. The desquamation of the left leg after admission was probably due to the turpentine ointment rather than to dermatitis. A variety of eruptions may occur in polymyositis (Review, *loc. cit.*), but that the initial disease in this case was measles was proved by the fact that the mother who nursed the patient contracted the disease. Evidently the attack of "rheumatism" which was diagnosed before admission was the first attack of polymyositis. Of the drugs and local applications employed a 10 per cent. ichthargan ointment alone appeared to be of service.

(2) POLYNEURITIS.—Though several cases of paralysis after measles have been recorded, all but 2—those of Morton

(University Med. Magazine, No. 9, 1897) and Monro (Lancet, vol. i, 1894)—were of cerebral or spinal origin. The following case was seen by Dr. Edens: A girl, aged sixteen, who had completely recovered from an attack of scarlet fever 4 months previously, was seized with malaise and headache on March 7. Three days later she had a typical measles eruption. The patellar reflexes were present. The urine was normal. There was slight bronchitis, which on March 17 developed into broncho-pneumonia with dulness at the bases. On March 13 there was right otorrhea. On March 19 there were pains over the sacrum and in the legs, and great tenderness in the popliteal spaces especially along the edge of the semitendinosus tendon. The knee-joint, patella, and tibia were not tender. Gently pinching up a fold of skin was painful on the outer side of the thighs and legs and in the calves. There was great hyperesthesia over the calcaneum and the feet were placed so that no pressure was applied to the heels. Later in the day this hyperesthesia had increased and the slightest touch of the soles or legs, except over the tibia, was unsupportable. On the thigh the flexor surface was the most sensitive. There was cutaneous hyperesthesia of the back below the first lumbar vertebra, which extended forwards to the posterior axillary line. Sensation in the skin of the chest, abdomen, head and arms was normal. Slight touches were more painful than steady pressure. Thus though the weight of the bed clothes was well borne they could not be moved without pain. On March 20 the right shoulder and elbow were tender and painful if freely moved. There was paresis of the legs which, when extended, could voluntarily scarcely be raised from the bed. Flexion of the knee and movements of the toes and feet were well executed. In the evening the cutaneous hyperesthesia had diminished remarkably, and even the heels were scarcely tender. But the lower limbs below the knees were slightly numb, and the right shoulder was more painful. The most tender point was immediately below the acromion process, but the nerves in the right axilla, the musculo-spiral nerve at its exit from the triceps muscle and, to a less extent, the ulnar nerve were also tender. In the popliteal spaces there was tenderness along the large nerve trunks. On March 21 the temperature, pulse and respiration became normal, the pain in the right arm was less, and the dulness at the bases had disappeared. On March 22 there was tenderness of the intercostal spaces and of the right angle of the jaw. The quadriceps femoris, and the popliteal regions remained tender. The knee-jerks and plantar reflexes were exaggerated, but there was no ankle clonus. On March 23 there was pain in the left ear and tenderness over the mastoid process (left otitis media). On March 24 the cutaneous hyperesthesia had disappeared. On March 26 there was extreme tenderness of the left facial nerve at its exit from the parotid gland. Paracentesis of the left tympanic membrane was followed by a copious purulent discharge and diminished tenderness of the face.

Cysticercus Cellulosae of the Tongue.—Dr. De Gaetano (Associazone Chirurgica Italiana, Congresso di Roma, March 1904).—A child, aged ten, came under observation. Two years before he noticed a nodule in the left border of the tongue of the size of a grain of millet. It remained indolent until three months before, when it attained the size of a pea, and impeded the movements of the tongue. On examination it projected a little and was covered by normal mucous membrane, which intimately adhered to its center. It was freely movable in every direction. There was no history of tape-worm; therefore diagnosis was doubtful. The tumor was easily removed and found to have all the characters, macroscopic and miscroscopic, of cysticercus cellulosæ, including the hooklets of the scolex.

Facial Paralysis Due to Digestive Disorders.—Dr. F. Rossi (La Pediatria, No. 5, 1904).—An infant suffered from abdominal pains and high fever. Seven days later he awoke at night with pain in the head and clonic and tonic convulsions of the limbs which lasted about a quarter of an hour. Five days later (on September 26) he was seized with vomiting, painful mucous diarrhea and headache, and was taken to the hospital. Examination showed right facial paralysis and a very painful abdomen. Under aperients he improved and the fever had disappeared on October 3. On the 8th he ate sweets and again suffered from headache, abdominal pains, and a relapse of the facial paralysis. Under castor oil he again improveed. While in hospital indigestion and facial paralysis were again twice produced by his parents secretly giving him sweets, and the symptoms again yielded to aperients. On the 31st he was discharged, but not until two months later had the facial paralysis completely disappeared. The writer thinks that the paralysis and other nervous symptoms were due to the action on the brain of toxins generated in the intestine.

Tuberculosis Among the School Children of Paris.—Grancher (Bulletin de l'Académie de Médecine, vol. lxviii. No. 25) has made a careful examination of 896 pupils in a certain section of Paris. He found that out of this number 141 were affected with latent but distinct evidences of glandular or pulmonary tuberculosis. These results are not very different from what might have been expected. Tuberculosis is very prevalent in Paris, due to deficient alimentation, unhygienic dwellings, and absence of sunlight. The observations are especially instructive from the public health standpoint. Unfortunately this sort of knowledge is confined largely to medical men, and reaches the laity only in an imperfect manner and often from an unauthoritative source. If the public were once fully informed of the desirability of the thorough medical inspection of schools much could be accomplished. Grancher makes an appeal for these tuberculous school children, urging that they be taken to the country.

Fatal Diphtheria of the Conjunctiva.—SYDNEY STEPHENSON (Ophthalmoscope, August, p. 303).—A girl, aged one year, was brought to hospital on January 7 on account of her eyes, which were red and running with mucus. A lotion and an ointment of boric acid were prescribed. She was in a wasted and neglected state. On January 11 the eyelids were red and so much distended that when drawn apart for purposes of examination, thin, watery pus spurted out. After the eyes had been cleansed a note was made that "thin flakes of inspissated pus" separated from the palpebral conjunctiva. Protargol (50 per cent.) was applied to the conjunctiva of the lids, and the other treatment was continued. On the following day "there was some bleeding when the membrane was removed" from the eyelids. Upon January 13 the baby was admitted. She was pale and collapsed. The temperature was 96.4 degrees, and pulse feeble, and the respiration slow. The eyelids were swollen and stuck down with discharge. There were membrane in both eyes and discharge from the nose. Sores were present behind the ears and on both buttocks, "apparently," so the notes run, "the result of neglect." The motions were frequent, the stools being green and including undigested food. At 6 P.M. the temperature was 102 degrees. On January 14 the author saw the child for the first time. She was a pallid, wasted, "snuffling" infant, affected with a degree of inspiratory dyspnœa. There were sores around the lips. The temperature was 101 degrees. There was no membrane in the fauces, but at the tip of her tongue was a circular ulcer coated with a thin membranous deposit. A thickish muco-pus ran from the nose, but no membrane could be seen in the nostrils. There were eczematous sores behind the ears, and ulceration around the anus and vulva. There was definite cutaneous diphtheria of the lower eyelid and inner canthus of the left eye. The upper eyelids were hot, markedly swollen, and of a violaceous color, and owing to their board-like consistence could not be fully everted. The palpebral conjunctiva was covered with an ashen-grey membrane, which could be detached only with difficulty, leaving exposed a bloodless and waxy-looking (lardaceous) conjunctiva. No petechial ecchymoses were present. There was some chemosis of the ocular conjunctiva. The corneæ were, however, clear. The preauricular and the submental glands were readily palpable. Diphtheria of the conjunctiva in a child the subject of heredity syphilis was diagnosed. Local treatment was continued, stimulants were given and 6,000 units of antitoxin were injected beneath the skin of the flanks. The baby became collapsed and died apparently from cardiac failure on January 15. A couple of hours before death the temperature was as low as 98 degrees. Membrane removed during life from the inner surface of the left upper eyelid yielded on cloture the diphtheria bacillus.

Diphtheria of the conjunctiva is far from rare in London. In a period of five years amongst 3,412 eye patients seen at two hospitals for children, there were forty-three cases (a percentage of 1.26). This number included all kinds of inflammations of the conjunctiva associated with the Klebs-Löffler bacillus, the presence or absence of which formed the test of a given case being diphtheritic or not. Nearly two-thirds of the cases were met with in children under the age of three. The prevalence of conjunctival diphtheria was greatest during those months in which ordinary diphtheria was most rife. Of the series only three cases belonged to the severe type described in the text-books as "diphtherial conjunctivitis." Symptoms.—Forty per cent. of the children were bodily ill, as shown by pallor, anorexia, languor, or wasting. The thermometer, however, generally revealed a slight reduction rather than an elevation of temperature. In some of the cases albumin was found in the urine, and in others the knee-jerks could not be elicited. Diphtheria of the fauces or nose preceded the conjunctival inflammation once, was associated with it twice, and followed it once. Diphtheria of the skin (eyelids, scalp or face) was present in seven children. In the more severe forms the preauricular and angular glands corresponding to the inflamed eye were more or less swollen, but in slight forms that feature was more often absent than present. For example, the glands were enlarged in 35 per cent. of the "mild" cases, in 55 per cent. of the "moderate" cases, and in 100 per cent. of the "severe" cases. The malady was unilateral in thirty-two patients—(about three-fourths of the whole number). The cornea was merely hazy or actually ulcerated in 30.32 per cent. The infection was "pure" in 13.95 per cent. and "mixed" in no fewer than 86.04 per cent. No connection could be traced between the associated microbes and the severity of the diphtheritic process on the other: The most trivial "croupous" and the gravest "diphtherial" were linked by a whole series of cases having intermediate grades of severity. Both forms were definitely influenced by antitoxin.

In the case now reported death appears to have been due to toxemia induced by conjunctival diphtheria alone, inasmuch as no membrane could be found in the nose, mouth or fauces. In every other fatal case reported there was complicating diphtheria of the nose or fauces. The muco-purulent secretion, observed to run from the child's nostrils, was all that suggested the coexistence of nasal diphtheria.

Infantile Myxedema.—ROBERT HUTCHISON (Polyclinic, August, p. 104), reports the history of a girl, aged sixteen, who was brought to hospital for general backwardness (Fig.). She was greatly stunted in growth, her height being only 3½ feet. The face exhibited the puffiness, scanty eyebrows and malar flush, characteristic of myxœdema; the hair was dry and coarse; there was no signs of puberty; the mental condition was backward, but by no means imbecile; the rings of the trachea could be easily felt. She had always been backward, but the symptoms had been more pronounced since the age of four. The diagnosis was "infantile myxœdema." This condition probably differs from cretinism, either in not being truly congenital, but the result of an atrophy of the thyroid at some period subsequent to birth, or perhaps in being due to a functional insufficiency of the thyroid rather than to its total absence. The arrest of development, both bodily and mental, especially the latter, is not nearly so great as in cretinism. On the other hand, it presents an exact resemblance to myxœdema in the adult. From infantilism infantile myxœdema differs in showing, not a mere arrest of growth but pathological features also. In infantilism the subject would be a normal child of a lesser age; a case of infantile myxœdema would be abnormal for any age. Under thyroid treatment the child grew 1 inch in three months and showed great improvement in her general appearance.

The Addition of Citrate of Soda to Cow's Milk in Infant Feeding.—F. J. POYNTON (Lancet, Aug. 13, 1904).—The author describes the principles which underlie artificial feeding, and expresses a distrust of percentages and a want of confidence in humanized milk—milk with bovine bodies and human faces. There is a difficulty in the digestibility of cow's milk which is sometimes so great that to some infants it seems to be almost a poison, hence no alteration will admit of its being employed for all infants. The dilution of milk makes a curd more digestible, but there is a danger of underfeeding. There are all sorts of methods for meeting the indigestibility of cow's milk and for giving the child sufficient nourishment. The humanized milks retain the fat and reduce the proteid, but they do not alter the nature of the curd, and if they are sterilized for long periods their nutritional value is lessened. The citrate of soda method was first described by Wright in the Lancet of July 22, 1893. It is based on the theory that the clot formed by rennet is firm, while that due to acid coagulation is loose. Wright was of the opinion that much of the milk dyspepsia of infants was due to the indigestibility of the rennet curd of cow's milk. The citrate of soda precipitates some of the lime salts, which are important elements in forming a firm clot, as these salts exist in excess in cow's milk, and an elimination of a portion of them is useful in infant feeding. A good working formula is one grain of citrate of soda to the ounce. The most accurate method is to take the particular sample of milk each morning and to test the clot with rennet and dilute acid, as the different samples of cow's milk vary. If the clot is denser than usual more citrate is needed. Unintelligent mothers cannot be expected to do this, so it is wise to judge from the severity of the case how much citrate to use. In an infant of four weeks who is doing badly, and in whom digestion is only moderately impaired, one grain of citrate of soda is added to each ounce of milk. If the symptoms are more severe the proportion is increased to two grains to the ounce. The alteration of the taste of the milk is slight. Citrate of soda is a neutral salt and does not inhibit the secretions of the gastric juices as do the alkaline salts. The partial precipitation of the lime salts simply prevents the formation of too dense a curd. The most of them are absorbed. No ill effects are caused by this method, but it has its limitations. In severe neglected cases it may fail, and in those with organic disease of the digestive tract. The advantages claimed for the citrate of soda are: (1) It renders the curd of cow's milk more digestible; (2) It is cheap; (3) It is convenient to handle and easy to control; (4) it allows the milk to be given in a more concentrated form, and thus avoids to some extent the danger of underfeeding; (5) there is no danger of scurvy.

PEDIATRICS

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ORIGINAL ARTICLES

SCARLET FEVER

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Scarlet fever is an acute, contagious, self-limited disease, one attack usually protecting the individual through life. The period of incubation is usually from two to six days; that of invasion from twelve to twenty-four hours; that of eruption from four to six days; that of desquamation from three to six weeks. The disease may be communicated at any time from the first symptom of invasion throughout desquamation, and sometimes even during the existence of purulent discharges from the nose, or other mucous membranes. It is usually ushered in by vomiting, high fever and sore throat, and is characterized by an erythematous rash, which appears first upon the neck, spreading rapidly over the entire body. The chief complications are otitis and membranous inflammations of the pharynx, which frequently extend to the nose, more rarely to the larynx. The most frequent sequelæ are deafness and nephritis.

Etiology.—Analogy lends to the belief that scarlet fever is due to a microorganism, but as yet its nature has not been discovered. The complications are usually associated with the growth of the streptococcus pyrogenes. Some have gone so far as to claim that this germ is the cause of the disease. From present knowledge, it appears rather to play the rôle of a secondary or accompanying infection, for the development of which the mucous membranes of a person suffering from scarlet fever seem to afford most favorable conditions. To the streptococcus may be ascribed the membranous inflammations of the tonsils and pharynx; the otitis the inflammations of the lymph nodes, and all cellular tissues of the neck, and probably the nephritis, pneumonia and joint lesions. In many of the above conditions the streptococcus is associated with other pyogenic germs, and in some cases with the diphtheria bacillus.

Predisposition.—The susceptibility of children to the scarlatinal poison is much less than that to measles, still it is much greater than that of adults.

Mode of Infection.—The chief source of infection is the patient himself. It is somewhat doubtful whether the poison of scarlet fever can be conveyed by the breath, but it may be by the discharges from the membranes involved. Also from the scales, during desquamation, and probably from all the excretions. Infection often takes place from the carpets or furniture of the sick-room, and from the clothing of the patient.

Duration of the Infection Period.—There is no evidence to show that the disease is communicable during the period of incubation. It, however, becomes so from the beginning of invasion, even before the rash appears. Infection is doubtless most active during the febrile period from the second to the fifth day, and next to this during the period of active desquamation. The average duration of the contagion might be placed at six weeks.

Lesions.—The only essential lesions of scarlet fever are those of the skin and the mucous membranes of the throat. The other changes occurring in this disease are considered in the light of complications, under which head they are described.

Symptoms (*Invasion*).—As a rule, the invasion of scarlet fever is abrupt, the symptoms at the onset being directly in proportion to the severity of the attack. In the majority of cases there is vomiting, a rapid rise of temperature, and soreness of the throat. After the vomiting is repeated, it is frequently forcible and without nausea. In severe cases the rise of temperature is very rapid, to 104 degrees or 105 degrees, and in the mildest cases it may not be more than 101 degrees.

Eruption.—Eruption usually appears from twelve to thirty-six hours after the first symptoms of the invasion, exceptionally not until the third or even until the fifth day. A later appearance than this is somewhat doubtful, for the rash not infrequently recedes and reappears, having been overlooked in the first instance. Variations in the eruption are very frequent, and often extremely puzzling. In mild cases the rash is not seen upon the face; is often faint upon the body, and may be present only upon certain parts of the body, and may last only one day; escaping notice altogether sometimes. It may be absent in some very mild cases, in certain others where the throat symptoms are severe and in malignant cases. In the very severe cases many irregularities are seen, both as to time of the appearance of the eruption and its character. Sometimes it occurs as large, irregular patches; at others it is maculate, closely resembling the rash of measles. With the eruption at its height, there is intense itching or burning of the skin, and severe cases show considerable swelling, chiefly noticeable upon the hands and face. All the constitutional symptoms increase in severity as the rash develops, and usually diminishes as the rash fades.

Desquamation.—Shortly after the rash has faded, there is an exfoliation of the dead epidermis, known as desquamation. This is even more characteristic of the disease than the rash. It is usually first seen upon the neck and chest, where it appears as fine scales or small patches. The desquamation of the trunk is completed from one to three weeks. If baths or inunction are being used it is scarcely perceptible. It continues longest where the epidermis is thickest, viz.: upon the hands and feet, and here it lasts from three to six weeks. The fingers and toes during desquamation are characteristic. The finger-tips usually peel first, and the new epidermis is pink and fresh looking, while that which has not yet separated is of a dull, grayish color, and loosened at the margin.

Complications and Sequelæ—Throat.—Three distinct forms of angina are seen in scarlatina, viz.: erythematous, membranous and gangrenous. Erythematous angina can hardly be ranked as a complication, as it is as constant as the scarlatinal rash. Usually there is only the general blush over the entire pharynx, with the fine red points upon the hard palate. But there may be seen upon the tonsils grayish-yellow spots, resembling those of follicular tonsillitis, which can be wiped off, leaving a clean surface. This simple angina is at its height during the maximum temperature, fading as the temperature falls, and does not extend to adjacent mucous membranes.

Membranous Angina.—These cases were formerly classed as scarlatinal diphtheria, but whether this process was identical with primary diphtheria or not, was for a long time a subject of much discussion. This question has, however, been settled by bacteriologists. It is now generally agreed that the membranous angina which occurs early in scarlet fever and that which develops at the height of the disease are almost invariably due to the streptococcus, the diphtheria bacillus being rarely found, but the cases which develop late in the disease after the primary fever has subsided are almost invariably true diphtheria. The bacillus being regularly present, the latter condition is to be regarded as scarlet fever, complicated by diphtheria.

Gangrenous Angina.—This is seen only in the worst cases of scarlet fever. The process may be gangrenous from the outset or preceded by a membranous inflammation. There is a fetid odor to the breath, irritating discharges from the nose and mouth, with considerable glandular swelling. The tonsils are gray or grayish-black in color, and large masses of necrotic tissue may be removed with the forceps from the tonsils, fauces or pharynx, and sometimes sloughing occurs in cellular tissue of the neck. Blood vessels of considerable size are sometimes opened, and serious, or even fatal hemorrhage, may occur. Little or no reparative process is seen. The constitutional symptoms are those of great asthenia, prostration and profound cachexia, followed almost invariably by fatal termination. I shall only refer to a few of the complications, on account of their number.

The Otitis.—The otitis is due to the direct extension of the infection from the rhino-pharynx. It is the most frequent complication of scarlet fever, and in doubtful cases may have some diagnostic importance. As a rule, the younger the child the greater the liability to otitis. Like all complications, it varies greatly with the epidemics, and is closely connected with the severity of the throat symptoms. As a rule, both ears are affected, but not simultaneously, or at least rupture occurs at different times. This is most frequent early in the second week, but may occur during convalescence. In the cases where otitis develops at the height of the disease, there are, in some cases, no new symptoms, in others there are pain and deafness. If it develops at a later period, there is usually a rise in the temperature, which falls after the rupture of the drum membrane takes place. The form of inflammation may be catarrhal or suppurative, and in some cases causes permanent deafness.

Kidneys.—Albuminuria accompanies most all severe cases of scarlet fever; in many this is simply the ordinary febrile albuminuria, due to the acute degeneration of the kidneys. In these, with severe throat complications and in nearly all septic cases, there is an acute inflammation of the kidneys, usually of the variety described as acute exudative nephritis. This occurs at the height of the febrile process, and is rarely accompanied by dropsy, but albuminuria, casts, and even blood, may be found in the urine The most severe and the most characteristic renal complication, and that generally designated as post-scarlatinal nephritis, is a diffuse nephritis, which, in most cases, develops during the third week of the disease. It is accompanied by general dropsy; the urine is scanty, and not infrequently suppressed, and contains a large amount of albumin and a great number of casts of all varieties. It may cause death by acute uremia, or may be followed by permanent damage to the kidneys.

The Joints.—Acute articular rheumatism may occur coincidentally with the development of the scarlatinal rash, and occasionally during convalescence in patients who have a predisposition to that disease. Acute swelling of the joints is sometimes of pyogenic origin.

The Lungs.—The pulmonary complications are neither so frequent nor too important as in measles.

The Digestive System.—Vomiting is the mode of onset in the majority of cases, but rarely continues through the attack. Late in the disease it is a frequent symptom of uremia. Diarrhea may be associated with it under both conditions. The tongue is nearly always coated, and clears off in quite a characteristic way, which, with the prominent papillæ, gives rise to the strawberry appearance.

Diagnosis.—The characteristic symptoms of scarlet fever are the abrupt onset usually with vomiting, the marked elevation of temperature, the erythematous condition of the throat, and the appearance of the rash within twenty-four hours. Before the rash, it cannot be diagnosticated from tonsillitis, or many other diseases. The difficulty of diagnosis usually depends upon the irregularities of the eruption, both as to time of its appearance and its character. These variations are seen in the mildest and in the most severe cases. In the former the temperature may not be above 100 degrees F. The rash may last less than a day, and may be seen only on the neck and chest, and probably be overlooked altogether. Nothing is positively diagnostic in those cases, but if the desquamation follows it is positive.

Prognosis.—The mortality of scarlatina varies greatly in different epidemics, ranging from three to forty per cent.

Treatment.—There is as yet no specific for scarlet fever, so the treatment is one of management of symptoms and complications. Mild attacks require scarcely any treatment at all. The authorities tell us that patients should be kept in bed for two or three weeks, but I have not been able to succeed well in this respect. During the height of the eruption the intense itching of the skin may be allayed with a weak carbolic solution, of by inunctions with vaseline, or free use of rice powder. Plenty of fresh air should be secured in the sick-room. As soon as the fever and rash have disappeared daily baths of soap and warm water should be used, after which the entire body should be anointed with carbolized vaseline, for the purpose of faciliating the desquamation and disinfecting the scales. The temperature often does not require an antipyretic; if so, a cold bath or wet pack or sponging with cold water will usually suffice, and is much safer than the coal tar preparations. The nervous symptoms are usually better controlled by applying ice to the head and sponging with cold water than by medication. As soon as the pulse becomes weak or rapid and irregular with a feeble first sound of the heart, stimulants should be given, no matter at what stage of the disease. In septic or malignant cases, or in those accompanied by severe angina adenitis or cellulitis, alcoholic stimulants must be used freely; carried even to the full toleration of the patient. Digitalis is next in value to alcohol, and is especially indicated where the pulse is weak and soft, with a low tension. The fluid extract may be given to a child five years old in minim doses, four times a day in the beginning, and later, if necessary, with greater frequency. Strychnine is also useful, and may be combined with digitalis or given separately, the usual dose being 1/200 of a grain for a child five years old, but may be increased in amount.

The erythematous sore throat requires no treatment more than a mild antiseptic gargle. If there is a profuse nasal discharge, nasal syringing with a warm saline or boric acid solution may be used, with the hope of preventing infection of the middle ear. The local treatment consists of various mixtures, to be used as sprays or mops, etc. Most all physicians have a preference for different remedies, such as iron and glycerine combined, ichthyol and glycerine, creolin in different strengths, peroxide of hydrogen and lime water, equal parts, and various other remedies indiscriminately. I have used quite a number, and I am rather inclined to the ichthyol, one dram to the ounce of glycerine.

Gangrenous inflammation of the tonsils or palate is sometimes benefited by injections of ten per cent. solutions of carbolic acid and glycerine; but most such cases prove fatal, no matter what the treatment. During convalescence, tonics, particularly iron and digitalis, are called for. The urine should be examined frequently for a long time after. Antiseptic gargles and a nasal spray should be used as long as a purulent discharge from the nose and pharynx continues.

DIAGNOSIS OF INCOMPLETE INGUINAL HERNIA IN CHILDREN*

HUGH CROUSE, M.D.

The differential diagnosis of hernia in early childhood, especially of the inguinal type, oblique or direct, is fraught with greater difficulty than in the adult. The meeting with recently of a lipo-myxomatodes in the inguinal canal of a two-year-old female upon whom I was attempting operative treatment, after having made the diagnosis of inguinal hernia, sack contents, entero-epiplocle, latter irreducible, has led to this report.

Mistakes more often lead to better information than uniform success. The medical man who never errs, either exists as perfect alone in his own imagination or ignorance, or has succeeded in concealing himself through a rare yet commendable modesty, for as yet he is not known among men. Acknowledged errors prove a benefit to others as well as to the unfortunate confessor.

Bull and Coley classify the following swellings that may be mistaken for incomplete inguinal hernia: Femoral hernia, hydrocele of the cord in the male, hydrocele of the canal of Nuck, and cysts of the round ligament in the female, undescended testis, psoas abscess, inguinal adenitis, retro-peritonal adenitis, tuberculosis of the cord, malignant disease of the glands, and fatty tumors, as lipona or lipo-myxomatodes.

In this case care was taken to differentiate hernia from the above confounding conditions. By utilizing the following differentiations, incomplete inguinal hernia can, as a rule, be separated from other confusing conditions, first, between *femoral* and *inguinal hernia,* although between which, according to Bull and Coley, when either exist in the female, differentiation is not always readily brought about. In the female we have lack of ability as in the male to use the passing of the index finger into the external ring by invaginating the scrotum, thus trailing the external pillar to the spine of the pubis; when located, this point may be used as one end of a line, the other terminating at the anterior spine of ilium; thus locating Poupart's ligament. In fat subjects Poupart's ligament is nearly always obliterated, thus leaving us with but the tensing of the adductor muscles, the adductor longus of this group serving as a guide to the spine of the pubis, the latter being found just external to the origin of this muscle; in fleshy subjects the fold or crease in the skin, which is nearly always in a direct line with the spine of the pubis and anterior spine of the ilium, permits the classifying of all tumors of a hernial type above this line as inguinal, below as femoral.

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In HYDROCELE OF THE CORD in the male the peculiar cyst-like character of swelling, which is generally globular, more freely movable, more tense than a hernial tumor, unless strangulation is present in the latter, permits differentiation between hydrocele and hernia.

In HYDROCELE OF THE CANAL OF NUCK there is marked difficulty in separating it from hernia. The following points aid: Hydrocele has peculiar sensation to pressure; is distinctly located in the inguinal canal, or can be pushed into the canal; is not reducible, or rarely so; has no impetuous on coughing or crying. These points, together with history of having originated without apparent cause, of having existed for considerable time, gradually increasing, with but few local and slight general symptoms, makes the diagnosis between the two reasonably certain.

LYMPHATIC GLANDS, either in the ordinary superficial adenitis or retro-peritoneal type, generally gives signs in the former of local inflammation, such as skin redness and superficial location, in the latter deep location, in the former are more in line of Poupart's ligament or below, and are sequels of same foot, leg, or genital inflammation of septic or malignant type.

PSOAS ABSCESS presents another most confusing differential point, as it may be in the exact location of incomplete hernia, have impetuous with coughing or crying, reduce on lying down, but by bi-manuel examination, having one hand over tumor, the other deep in iliac fossa, elicits fluctuation, besides demonstrating a tumor to exist deep in iliac area, and on careful examination shows that some bone involvement exists either in spine or pelvis.

RETAINED TESTIS shows absence of normal testicular presence in scrotum elicits history of testicle never having descended, has testicle shape and consistency, besides presents subjective sensations to patient, all readily aiding in removing such a liable confusion in diagnosis.

Fatty Tumors, the most frequent type of which is either lipoma or lipo-myxomatodes presenting in the inguinal canal. Senn's definition of a lipoma is as follows: "A circumscribed or diffused tumor composed of fatty tissue produced by a matrix of lipoblasts." Fatty tumors, as a rule, are superficially located, lobulated and softer in consistency than omental tissue. Certain of them are located in intra-muscular positions. Care in examining usually shows that they do not emerge from the inguinal canal when located in a hernial position, but extend toward the canal, rarely have an impetuous on coughing or crying, and are rather doughy in feel.

In the case that I am about to relate to you, the tumor's location was within the canal, underneath the aponeurosis of external oblique, intimately connected with internal oblique, thus giving it an impetuous with crying. Its mixed type and deep location gave the exact sensation of omental tissue.

The following is the history, briefly given, of the case that I have already mentioned:

Female, well-nourished child, age two years, was brought to me for repeated attacks of gastro-enteritis. Child had been breast-fed until eighteen months old; then indiscriminate foods were gradually allowed. None of the usual exenthematous fevers had occurred during the child's past. It was elicited on careful cross-questioning that excessive sweets, in the forms of candies, ice cream, soda water, etc., had been permitted. On stripping the patient and carefully running over organ after organ, heart was found normal, lungs also, liver not enlarged, spleen not palpable, abdomen distended, slightly tender, judging from actions of babe during examination. In the right inguinal area a tumefaction was disocevered, which on elevating and abducting leg seemingly was partly reducible; the growth was dull on percussion and gave to the examining finger a soft cystic sensation. There was an impetuous with crying; also manipulation seemingly produced pain. To be exact as to location, the tumefaction was above Poupart's ligament, outside of the spine of the pubis, and was "bubonocle" in appearance. Inquiry carefully made elicited the fact that the growth was first noticed three months before; that seemingly it was smaller in the morning than evening; that the child complained at times of vague pains above the navel, and, further, that the mass was markedly increasing in size. Weighing each point, viz., tumor, its shape and location, the presence of pain, impetuous on crying, variation in size between morning and evening hour, sensation to examining finger, i. e., partly cystic yet resistant, not lobulated, no signs of inflammation of the genitals, foot, or leg areas, no lobulation, inability to entirely reduce, led to the previous mentioned diagnosis, i. e., oblique inguinal hernia, sack contents, entero-epiplocele, omentum adherent and irreducible.

The question for proper treatment then arose. Deducing reasons for surgical intervention from the well known demand for such treatment, so clearly outlined by Coley, under the heading of "Indications and Contra-indications for Operations upon Hernia in Children," operation was advised and accepted. Coley claims the following to be the leading indications for surgical intervention: Operations should occur

(1) In cases of adherent omentum;

(2) In cases complicated with reducible hydrocele;

(3) In cases irreducible and strangulated;

(4) In cases unable to obtain care and attention requisite for successful mechanical treatment;

(5) In cases over four years of age, where mechanical treatment has been carefully tried for a number of years without benefit.

(6) In femoral hernia which, though rare, cannot be cured by trusses.

I further believed that a nearly certain increase in size of hernia would occur. That an adherent omental tag which I believed to exist, was liable to injury, and that part of the intestinal derangement were due to irritative reflexes starting from the epipocele. The intestinal symptoms were given the usual dietary and medicinal attention. The child later on was taken to a hospital and prepared for operation. Six weeks ago incision was made over the tumor, according to Bassini's technique, and upon incising the aponeurosis of the external oblique, the usual hernial conditions were not found to be present. Instead, the specimen passing among you presented itself. The tumor lay in the main within the inguinal canal; at its lower part extending out of the external ring over poupart's ligament in a thin sheet, practically into the crural orifice. So deceptive was the sensation to the examining fingers, even after the growth was thoroughly exposed, that a positive differential diagnosis between omentum and lipoma could not be made until the tumor was found to extend downward and inward, instead of upward and outward. Care was taken to see that the mass was removed entire, owing to the well known fact that a lipoma not removed entire still exists as a tumor in being. Such embryological tissue will rapidly reproduce itself as with all matrix existing cells, provided that the original inciting cause exists, viz.: That they are within the economy of a child, or person, where rapid development is taking place.

You may say such an error as this should not have occurred, but remember post dialectic conclusions selected is not ante premises. Also recall that many different swellings within the inguinal area, according to Bull and Coley, may be mistaken for incomplete hernia.

In resume: Given a history of a recently appearing tumor above poupart's ligament, to the outside of the spine of pubis; "bubonocele" in form; having an impetuous in crying; no signs of skin inflammation; no discoverable sources for lymphatic involvement present; having history of pain; variable in size between morning and evening hour; an intestinal irritation present; tumor only partly reducible; sensations to examining fingers of a semi-solid consistency, not lobulated, night strictly doughy, would you classify it as an oblique inguinal hernia? I believe that you would.

Having done so, and having recalled its irreducibility, liability to injury, known heirship to enlargement, contra-indications to mechanical treatment when irreducible, would you advise operation? I believe that you would.

But remember in the future when such a case presents itself for, your consideration, that a tumor in a female child above poupart's ligament, to the outside of the spine of pubis, "bubonocele" in appearance, does not always spell oblique inguinal hernia. Such is rare in infancy in the female. Luckē claims that a frequent situation for lipo-myxomatodes is within the gluteal and inguinal area. This specimen microscopically shows that the case was one of a lipo-myxomatodes, and from its situation should be denominated properly as an intra-muscularly located lipoma of mixed type. Operation was indicated through the well known liability in such growth to eventually extend beyond their parenchepera, thus exchanging a benign for a malignant, pathological condition.

A RESUME OF RECENT LITERATURE ON ECZEMA

By F. Gardiner, M.D., B.Sc., F.R.C.S.

Even in these days, when dermatologists are debating whether eczema is a phase of seborrhea, or again, a mere cutaneous reaction, to the general practitioner it is a common disease which is uncommonly troublesome. Sabouraud[1] summarises the various views thus:—

"1. Unna considers eczema as a specific parasitic disease.

"2. Almost the whole French school consider eczema as a polymorphic skin inflammation, symptomatic of an undefined debilitated state.

"3. Others consider that the word eczema ought to be applied to that dyscrasia itself of which the outward manifestations are the varied dry, moist, and purulent skin eruptions.

"4. Still others consider eczema as neither a disease in itself nor a manifestation of a particular state, but a reaction of the skin due to diverse causes. For those, indeed, there is no eczema, only eczematization."

Each view can be defended by various arguments and each has its own doughty exponent.

Whitfield,[2] discussing the first or parasitic theory, emphasizes the difficulty of eliminating the surface organisms from cultures; further, he points out that microscopically the primary vesicle is free from any emigrated cells, a fact which, to his mind, is strong evidence that the lesions are not caused by ordinary pyogenic cocci, whilst in addition no organisms have been demonstrated in the vesicle by appropriate staining, although, after rupture, secondary infection at once takes place. Bender, Bockhart, and Gerlach, investigating the effects of staphylococci derived from boils and impetigo, found that the staphylocci free from toxins were inert, but when their toxins were rubbed into an unhealthy or previously irritated skin a papular eczema was produced. From these and other observations, Whitfield concludes that although germs be on the skin they are not active until there is an abrasion and subsequent outpouring of serum which forms a suitable nidus for their growth.

On the other hand Veiel,[3] who studied the micro-organisms of chronic eczema in order to determine whether their nature was parasitic or saprophytic, found staphylococci in early and late stages almost exclusively, and that they were not those of the ordinary skin but pyogenic, he proved by agglutination and hemolysis.

Thus, although the parisitic nature of eczema is far from being definitely proved, yet many now admit the action of germs as one irritating cause. We fancy that few who have observed the inception and spread of the condition from a septic wound will deny this, even taking into account the irritation produced by surgical dressings. Apropos, it seems to us that too little attention is paid to the effect of these dressings on the surrounding skin, as on several occasions the effect of excessive dressing has been very marked and a widespread eczema might have been avoided by trusting a little more to nature and timely soothing of the skin. It is generally in slight injuries that such accidents happen, and the weeks of torture from eczema is at times more memorable to the patient than his original trivial injury.

With regard to the second class, it represents pretty generally the British teaching, if one couples with it the action of external irritants, but how far the internal economy is at fault and how far reaction from irritation is to blame is still the battle-ground. One has frequent illustrations of the action of external irritants; their character, the locality, and the history at once enable one to label them as baker's eczema, washerwoman's eczema, etc. Plant dermatitis is a condition now more frequently recognized, Primula Obconica in this country, and Rhus Diversicolor (Poison Oak) in America, being well-known offenders. Schwalbe[4] gives a summary of the effects of poison of the latter in almost infinitesimal doses. He considers the active irritant to be an oil which is carried by the hairs of the leaves and stalks; these hairs, which cover lactiferous ducts, stick into the skin glands. Those who are immune are individuals who sweat little and in whom consequently the duct glands are less open.

To return to the constitutional element in eczema, we note that Whitfield lays stress on alimentary disturbances as having the greatest influence, and most practitioners who are treating infants are only too glad to avail themselves of this reason if only to satisfy an anxious mother; but a local cause can as often be found, whether it be ichthyosis, carbolic soap or dirt. Heubel[5] mentions the case of a baby seven months old suffering from an eczema on which local treatment had no effect, the condition only improving after an excess of salt in the cow's dietary was rectified. Three months later a recurrence of the lesions occurred, and it was again traced to the milk of the cow being altered by excessive salt in its food; further to prove it was no coincidence, he mentions that another child fed on the same milk underwent the same experience.

Gout, especially in England, is often held as blameworthy, but on this point Robinson[6] makes some very pertinent remarks. "Does the presence of uric acid or its compounds ever initiate an eczema? Certainly it is true that quite a number of those who are eczematous have, at the time of our seeing them, some evidence of gout or they relate to us testimony which proves they have the gouty diathesis. The characteristics of all gouty inflammations are threefold: they are sharp, sudden and fugitive. Eczema may be sudden in its onset, but it is not a fugitive condition. Direct investigations in scraping the secretion from any eczemous area and examining the same for urate of soda or uric acid have given negative results. There is one other argument against eczema being symptomatic of gout, which is that the administration of colchicum in cases of eczema does not act as a curative, and so far as has been observed is without any effect." He goes on to turn the tables completely by suggesting that as eczema and gout are commonly associated, and as sufferers from eczema have an imperfect skin, even when at its best, its excretory power will be limited; effete matter will collect in the blood, more work will be thrown on the kidneys, and gout consequently will develop. The statement is a reasonable one if it can be proved that the skin is really defective in its excretory capacity.

An interesting example of the effect of nervous strain is quoted by Whitfield: it is that of a man very bound up in the scholastic achievements of his sons, who had regular attacks of eczema on his hands when any of these sons were up for a scholarship examination. The eczema subsequently disappeared when the ordeal was over.

In every case it is wise to inquire thoroughly into the general health of a patient with eczema, because, as Macleod[7] puts it, "any diseased organ or system may be capable, if not of causing a dermatitis, certainly of aggravating it." We would emphasize that "may" because even gross visceral lesions often have absolutely no effect on an eczema.

The third class is represented by Trémolières,[8] who holds that "one does not cure eczema but the eczematous. The eruption, whatever be its direct cause, never appears but in a predisposed subject." Most of us will regard this generalization as far too sweeping, and the "eczematous" would be difficult to diagnose.

In the fourth class, who consider the disease as a cutaneous reaction to irritation, we find Brocq[9] as an able exponent. In recent papers he has defined eczema as "a prolonged reaction of the skin, accompanied by the production of vesicles," while he divides the condition according to the age of the individual, and finds that the seat of eruption and its character vary with the time of life. Warde[10] gives illustrations of the effects of heat and cold as causative agents in the production of eczema: with the former the vessels are dilated and effusion of lymph is great; with the latter the vessels are contracted and the tissues are drier, therefore the greater strain thrown on the vessels results frequently in the production of hæmorrhages, as in chilblains.

The action of internal irritants is exemplified by Mantoux's[11] report on the effect of coffee given to three eczematous patients, who, amongst others, had previously been some time in hospital. All three developed new spots next day.

These four theories have all able advocates, and we quote Whitfield's conclusion as representing to our mind a fair index of the trend of British opinion.

"Eczema may be caused by external irritants alone, when these are of suitable strength and act for a certain time. Certain skins are from birth of low resisting power, so that their owners are liable to attacks of eczema under circumstances which would not affect normal skins. Other skins have some gross and visible defect, such as ichthyosis or diminished or excessive secretion, which lays them open to more frequent irritation, and they therefore suffer in the same way. By repeated irritation, or more rarely by a single powerful irritation, the resistance of a normal skin may become so lowered that irritants hitherto inefficient become efficient causes of the eruption."

Treatment.—The skin as an excretory organ when incapacitated requires rest in order to undergo repair. One of the finest remedies in heart disease is rest in bed, and its rationale is that it lessens the work of that organ; yet too often it is forgotten that the skin requires just such careful consideration. Certainly in acute generalized eczema it is almost essential, and it often proves beneficial even in slighter cases, as, for instance, when the lower limbs are involved. Macleod puts the facts concisely: "By rest in bed the strain on the skin's activity is lessened and much of the irritation from friction and compression to which it is subjected in moving about is avoided. Hyperæmia is also reduced, since by means of the horizontal position the strain is taken off the heart, and the tension in the cutaneous blood-vessels is lessened. The temperature of the room can be regulated, and light, non-irritating clothes chosen, so as to reduce pruritus. But one of the most important considerations of all is the facility with which local remedies can then be applied to the patient, and instead of local treatment being carried out in a half-hearted way, the utmost benefit may be derived from it."

As regards internal remedies, we agree with Trémolières that generally they are not indicated until local means fail; he advises their use in the acute widespread inflammatory type and also in old age. In the same article he recommends the use of alkalies where there is any rheumatic or gouty history; cod-liver oil, which is frequently given to strumous individuals, he considers is sometimes responsible for the appearance of new lesions, and on the whole prefers in these a syrup containing a combination of iodine and tannic acid, while in nervous cases valerian and asafœtida have given him the best results. In conclusion, he emphasizes the value of intestinal antiseptics, careful dieting, and detailed attention and treatment if necessary of all the emunctories.

In more acute conditions antimony in the form of tartarate, as recommended by Jamieson, or the wine in 10 minim doses every two or three hours, as recommended by Morris, is still used by many.

Brodier,[12] who is strong on the virtues of internal medication, finds an important place in his armamentarium for such drugs as quinine, colchicum, digitalis, and ergot; belladonna he uses when there is much exudation, and valerian in adults, bromide of potash in children, sulphonal and trional give him best results in pruritus, nervousness and insomnia. Wise insistence is laid on the evil effects of opium and chloral on skin lesions; while even on the Continent it seems difficult to inculcate the general practitioner to the fact that arsenic is only useful in a limited number of skin eruptions, and that acute and subacute eczema suffer from the exhibition of the drug.

Pruritus is often a very troublesome condition for which drugs are given, and their futility may be explained by the interesting observation of Brönson, who pointed out that it could be accounted for by the morbid anatomical features of the disease—papules, vesicles and postules, arising as they do in the epidermic layers, being very itchy, while lesions affecting the corium are not so affected.

On the subject of diet there is a general consensus of opinion that a regimen of milk is indicated for a few days at least in inflammatory eczema, while many recommend a free use of vegetables as part of the diet after recovery; but Whitfield states that he has observed acute attacks on vegetarians only disappear when a diet of meat and hot water was substituted. Besnier is quoted by Trémolières as saying that "the eczematous individuals in general eat too much for their mode of life. Therefore they should be counseled to restrict their diet and to have meat only at one meal." He further would omit fish, veal, pork, cheese, acid vegetables, such as tomatoes, spinach, asparagus, and onions, and alcoholic liquors of any kind.

Local Treatment.—This must depend entirely on the stage of the disease and character of the eruption, and no hard and fast rule can be laid down. In the early acuter stages, Brodier advises a treatment commonly adopted in this country, viz., the application of starch poultices, but in some cases he finds camomile lotion acts better, and in old arthritic cases prefers to use dusting powders of bismuth, talc, zinc oxide, starch, and lycopodium. If the eruption passes the erythematous and papulo-vesicular stages, Whitfield considers that powders are no longer useful, and lotions which are mildly antiseptic are best, as they allow free drainage. Of these, lead lotion, which is only useful when moist, calamine, which acts even when dry, and ichthyol, not stronger than 3 per cent. in water, are commonly used by him, the addition of 1 per cent. carbolic acid being made if pruritus is severe. On a limited weeping area with œdematous base, as frequently seen near the flexures of the limbs, a solution of ½ to 10 per cent. of silver nitrate or nargol is recommended by Alibert, and has long been in use in this country.

Lyle,[13] acting on the parasitic theory, claims successful results in all his cases of weeping eczema by the application of lint soaked in 1 in 2,000 biniodide of mercury; the affected parts, he states, become dry, and any remaining patches are again treated, the cure finally being completed by ointments or lotions.

Blake[14], with a similar bactericidal end in view, uses formalin, apparently in 1 per cent. solution, in dry eczemas; and where there is exudation, glutol, which is a combination of formaldehyde and gelatin in formulæ such as—

Glutol, ʒi
Pulv. talci, ad ℥i

Gaucher has obtained excellent results in acute eczema with picric acid 1 per cent. in water. The part previously cleansed by moist applications is painted every two or three days with this, and after each painting is dressed with aseptic wool and bandaged, the only precaution being that the head must be avoided, as this treatment stains the hair yellow.

The chief difficulty in practice with these strong lotions is, as Jamieson points out, that caking of the secretion takes place, and this has subsequently to be removed by poultices to prevent further suppuration.

Later stages of acute eczema are treated with bland ointments of zinc, bismuth, or salicylic acid, according to the choice of the prescriber.

When the disease is chronic, stronger remedies are required, and these, according to Whitfield, may be classified into these without and these with marked overgrowth of the epidermis and sclerosis of the true skin. For the first, plasters or ointments containing oil of cade, 2 per cent.; pyrogallol, 1 per cent.; or chrysarobin, 4 per cent., may be used, and the strength increased if necessary; but when there is great overgrowth, the chief methods used are the application of a strong 5 to 10 per cent. salicylic acid ointment or plaster, painting with a solution of liq. potassæ, or scrubbing with soft soap. Any of these latter modes produce strong irritation, and therefore subsequent soothing is required by lead plaster, or oleate of zinc ointment.

With Trémolières, oil of cade is first favorite, because, in addition to its intrinsic value, it has no disadvantages of strong odor or staining clothes. He uses it in various forms—pure, mixed with an equal quantity of almond oil, 10 to 50 per cent. in vaseline, 30 per cent. in glycerine of starch, and 50 per cent. in acetone collodion. It must be remembered, however, that its prolonged use may lead to the production of acne.

Gelatine preparations, as originally recommended by Pick and Unna, are now chiefly used to facilitate the application of topical remedies, such as ichthyol or boracic acid, when the patient is walking about; they cannot be used when there is much oozing, as the dissolved gelatine then acts as an irritant. The one in use at the Edinburgh Skin Clinique contains gelatine, 15 parts; zinc oxide, 10 parts; glycerine, 30 parts; water, 40 parts; and to this 2 per cent. ichthyol is subsequently added.

Lastly, in obstinate cases, and some would say in subacute cases also, exposures to X-rays have proved of undoubted value. We can, from our own experience, agree with such writers as Stelwagon,[15] Williams,[16] and Zeisler,[17] who have notified many successes. The action of the rays is in this, as in other skin conditions, destructive to new formations and stimulant to healthy tissue growth.

In conclusion, we would sum up by saying that recent research, although it may not have brought to light many new remedies of value, has taught us how to use the old drugs in a more scientifically accurate manner.

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HINTS ON THE DIAGNOSIS AND TREATMENT OF PNEUMONIA IN YOUNG CHILDREN*

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THIS paper was suggested by recent experiences in the severe epidemic of measles last winter, in which pneumonia was a very common complication. You are familiar with the scientific text-book presentation of the subject, hence I shall only emphasize some practical points in the diagnosis and treatment of the disease as found in young children and infants.

In the examination of infants we should not forget that all symptoms are objective, while a difference in anatomy and a decided modification of physical signs demand a different interpretation from identical exhibitions in the adult. To illustrate. The apex beat of the heart is normally in the fifth interspace and from one-half inch to one inch to the right of the nipple line. In an infant it is in the fourth interspace, or even slightly to the left of the nipple line, according to authorities quoted by Holt. This certainly is a fact of prime importance; in the diagnosis of a pleuritic effusion, for example. The thorax is cylindrical—antero-posterior and transverse diameters being nearly equal—and not cone-shaped, as at puberty. Its walls are thin, lacking in muscular developments, very elastic and yielding, while its capacity is encroached upon by the higher position of the diaphragm, with a relative increase in size of the abdominal cavity. The bronchi cells are smaller, filling greater space, at the same time the air cells are smaller, filling less space, and the lungs are situated more posteriorly. The respiration is normally about thirty-five at birth, easily disturbed and irregular, rhythmical respiration not being established until the end of the second year. The stomach lies more obliquely, and the liver is proportionately larger than in the adult. These anatomical facts should be remembered in order that changes in physical signs caused by them should be rightly understood; otherwise serious errors in diagnosis are likely to be made. Again. The normal percussion note is somewhat tympanitic, while the normal respiratory murmur is hard to describe accurately, but, roughly speaking, approaches the sound of bronchial breathing in an adult. The signs of pulmonary disease are usually more distinct in the back, or high in the axilla, and because of the small size of vesicles, "acute congestion may interfere with function almost as completely as consolidation."

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A diagnosis of pneumonia simply is unsatisfactory. True, all pneumonias have a family likeness, but only a superficial study of cause, course, symptoms and termination is necessary to show essential differences, a knowledge of which dictates the particular line to be adopted in caring for a given case. I know we see many puzzling cases of mixed character, but as a rule these can in a short time be classified sufficiently to indicate the proper line of treatment. I do not mean that hard and fast rules must obtain according to the name of the disease—on the contrary. But I do mean to say, one must be governed by certain fundamental principles of treatment, fixed by essential differences between the several forms of disease to which we give the general name, pneumonia, modified by special developments, surroundings and individual peculiarities.

This groundwork of hints will find expression in the consideration of labor and broncho-pneumonia, the two varieties of this disease to which I will confine myself. Lobar Pneumonia is not common in children under two years of age, rarely results fatally except in infants or delicate children, is self-limited, and treatment is plain and simple. Yet the onset is frequently violent, the system being so overwhelmed with the shock that I am persuaded the fight is often lost or won in the first thirty-six hours. Here is a case in point:

I was called early one Sunday to see a little girl 3 years of age. I found her in a stupor, respiration superficial, rapid and jerky. Slight cough, pulse feeble, irregular and quick; surface slightly cyanotic, fever 103½°F., but extremities cold. She was up the day before, but had some cold and cough; was chilly, vomiting frequently, and very restless at night, quieting down toward morning. The mother thought the child was better, until she attempted to give her a dose of oil following calomel given the night before, and found she could not arouse her. I thought I discovered slightly diminished resonance on the right side, with a rather feeble respiratory murmur, but the examination yielded no positive information. This condition continued throughout the day. I finally decided, from the history, peculiar respiration and general condition, that it was a case of lobar pneumonia. Her condition was so alarming I called in another physician in consultation. The case seemed hopeless to both of us, Only a faint thrill could be found at the wrist; the surface was cold and clammy, while the stupor was profound. Experience teaches that it pays to fight for a baby's life until death actually takes place, and in this instance I decided to remain with the patient. I used hypodermics of strychnin, atropin, hot mustard baths and packs, high rectal enemata of salt solution, as my judgment dictated. Absolutely no results were obtained until 9 o'clock Monday morning, when permanent reaction was established. On the fourth day the area of the consolidation was plainly defined, crisis came on the seventh day, and recovery was complete and uneventful.

In this case I found no pleurisy; but, as a rule, it is present in most cases lasting over four or five days, in which there is a considerable area of consolidation. It also impressed me with the correctness of Holt's statement that a "consolidation is rarely ever demonstrated before the fourth day, and sometimes later."

If well looked after, an average uncomplicated case of lobar pneumonia in a child will do well without internal medicine at all. Nevertheless, it requires the exercise of good judgment and watchful care along definite lines. First, the digestion must not be overlooked. Holt is right when he says "No case is hopeless so long as the food taken is properly digested," but the digestion is very apt to be faulty, and this means tympanitic bowels with resulting pressure on a laboring heart and lungs, together with the grave symptoms caused by auto-intoxication, bad enough in themselves without the pneumonia. Select food carefully, watch stools daily and keep bowels clean by irrigations when indicated. The indefinite findings on early examinations of the chest, and the early disturbance of digestion may lead to serious errors if we are not on our guard. I once saw in consultation an eighteen months old bottle-fed baby which had a consolidated right lung and empyema. The history was of a delicate child subject to acute attacks of indigestion. It became suddenly sick about six weeks before I saw it, with tympanitic bowels, stools showing undigested food, slight cough, high fever, and general prostration. The first physician was struck by the rapid breathing with expiratory grunt, and at first said it had broncho-pneumonia, but finding no râles, the bowel symptoms absorbed his attention and he treated accordingly. The child finally reached a stage of apparent convalescence, very little fever with improved digestion, and the case was dismissed with the statement that a complete recovery would depend upon careful feeding and nursing. After a few days the mother became uneasy because child did not improve; the breathing seemed unnatural, and she called another physician who, on examination, found the lung and pleura in the condition stated. An incision was made and the pleural cavity emptied of several ounces of pus, together with a quantity of stringy fibrin. The real disease was overlooked because evidently the chest was not interrogated except at first, and the condition of the digestive organs apparently accounted for all the symptoms.

Never give any medicine which will disturb the stomach, and most of the syrupy combinations will.

Second, give the patient plenty of fresh air, cool water to drink and don't allow the child to be smothered in clothing. How often have you entered a room with every window shut tight, the air close, dry and superheated by that friend of the undertaker, a sheet-iron stove, and found a child with high fever, a rapid pulse and respiration, buried in blankets, with flannel underclothing and outing gown over that, and had the mother say, "Doctor, can't you give the baby something to make him sleep? he doesn't rest a minute"? A well-ventilated room, free from draughts, kept at a temperature of 70 degrees, is what is needed. For clothing a light cotton jacket with an outing cloth gown and a soft blanket is ample.

Third, treatment. For this we have four leading indications, first, to control excessive fever; second, to allay nervousness and secure a proper amount of sleep; third, to check cough at first when it is dry and irritating, and to encourage it when loose; fourth to support strength.

To save repetition these points will be noted in the discussion of broncho-pneumonia, which I now take up. While lobar pneumonia is self-limited, and requires but little treatment, broncho-pneumonia is not, and its severity and duration depend very much upon the skill of the physician in charge. This is a common disease of childhood, and one of the most serious we are called upon to treat. It is usually secondary to bronchitis, influenza, pertussi and eruptive diseases, particularly measles; yet it is sometimes primary, and the onset of these primary attacks resembles that of lobar pneumonia, while as a rule the secondary form develops insidiously.

The diagnosis is made from the general picture, rather than invariable and marked characteristic physical signs. In fact, the disease described by the name broncho-pneumonia includes several distinct forms of infection; as a result the symptoms and signs are variable, and lack that uniformity of manifestation found in lobar pneumonia. Still, when we observe the high fever of remittent type, rapid respiration with expiratory grunt, the constant cough, suppressed cry, dilating alæ of the nose and the marked tendency to dyspnea, cyanosis and prostration, with râles of various character bilaterally, we may confidently look for some spot or spots somewhere in the lungs, probably low down near the spinal column, over which we can hear the fine moist râles described as the first distinctive sign of broncho-pneumonia, and thereby confirm the diagnosis. Watch these spots and you will probably soon find distinctive signs of consolidation, shading into healthier lung tissue; but if not, it is no argument that diagnosis is wrong, for consolidation cannot be demonstrated in every case of broncho-pneumonia. The digestion is weakened by fever and general depression, while the sputum, which is swallowed constantly, adds an additional cause of disturbance. We must therefore seek to keep the lungs as free as possible, and at the same time watch the bowel elimination and digestive functions closely. "At the beginning every child has a definite resistance to withstand the disease, and an effort must be made to preserve every strength unit which the child possesses." Success demands close conformity to this law so graphically stated by Kerley in the words just quoted. This means an even temperature, plenty of fresh air, proper clothing and all the hygienic measures already suggested, as well as constant attention to the feeding, giving specific directions as to what shall be fed, how often and how much. Measures of this kind put into practice will materially lessen the nervous restlessness so exhausting to the patient, or at least permit of its easier control.

In beginning the discussion of the medical treatment I wish to lay special emphasis on this point—don't overtreat. I once treated a certain baby through an attack of bronchopneumonia. She became fat and rosy, recovery being prompt and complete. The next winter her mother took her for a visit to a distant city, and while there she died in another attack of the same disease. When the parents returned the mother told me the circumstances of the child's illness. She said she had two splendid doctors who did everything possible for her baby; that the last day and night of sickness they gave a dose of medicine every half hour, using four different kinds, but in spite of all this the baby died. I cannot imagine any possible condition in this disease or any other which would require forty-eight doses in twenty-four hours. A few drugs are indispensable given for a definite purpose, and three hours apart is often enough to give them by mouth. A little planning will enable you to have medicine and nourishment taken about the same time, if not together, and every minute of rest is valuable.

The fever may need some control, but "the nervous symptoms are a better guide to the use of antipyretic measures than the thermometer," is a statement from Holt that I heartily endorse. He says that cold is the best antipyretic. I would amend that and say that water is the best, used cold or hot, as indicated. Young children do not stand cold well, and sponging with tepid vinegar or soda water will usually suffice, but in this disease, above all others, do we have a tendency to cool extremities though the fever may be high. In this condition cold is contraindicated, but sponging with water as hot as can be borne, or better still, a mustard bath, will reduce the fever and soothe the nervous system wonderfully. The cough must be looked after with judgment. It is nature's method of relieving the lungs, and must not be suppressed; at the same time if dry and irritating nothing wears the patient faster. We seek to loosen the secretions and allow just enough cough to keep the lungs free. Cough mixtures containing opium are often prescribed, but opium checks all the secretions, except of the skin, and these mixtures disturb the digestion. Be very shy of opium in broncho-pneumonia, though I would not be understood as condemning any remedy if its use is directed by sound common sense. Occasion may arise when small doses of paregoric alternated with ipecac, as advised by Rotch, might fulfil the indications exactly. I prefer the hydrochloride of heroin rubbed up with sugar of milk and given in minute doses. It does not interfere with the secretions, nor disturb the stomach, quiets the cough, particularly the nervous form, promotes sleep and causes the respiration to become deeper. It does, however, constipate, but in a less degree than opium. One method is seriously neglected which I consider indispensable, and that is the administration of drugs by steam inhalation. My plan is to keep the air of the room constantly moist with steam, impregnated with compound tincture of benzoin, and at intervals of two to four hours to have direct inhalations used for fifteen or twenty minutes, selecting as remedies lime, soda, turpentine, creosote or terebene. Lime and soda are relaxing, therefore used when bronchial secretions are tough with hard ineffectual cough. The others are more useful later when the sputum is loose or excessive. Holt says, "inhalations are of more value in relieving cough and in promoting bronchial secretions than any means we possess." They can be administered during sleep without disturbing the patient, nor is it necessary to have the outfit of a hospital to use them. A tea kettle on a fire place, grate or stove, with a tin spout to conduct the steam into the room acts admirably for the benzoin preparation. I once used a long gourd handle on the spout of a tea kettle for this purpose. A broom handle leaning against the head board with a sheet thrown over it makes a very serviceable tent for direct inhalation. This tent can be filled with steam by pouring boiling water into a bowl placed in a chair beside the bed and under the sheet. Hot bricks placed in a dish pan and water poured over them will produce a large volume of steam very quickly. Certainly a croup kettle or a gas stove would be more convenient, but I mention these substitutes to impress the fact that there is no excuse for not using this method of treatment.

Shall we make local application to the chest, and if so, what? I believe in putting a cotton or oiled silk jacket on every case of pneumonia, except when the temperature is excessive. I prefer the cotton quilted on a knit undershirt, open in front. This is easily done, and the fit is better than in the ordinary way. Poultices are heavy, wet, and require frequent changing. I do not use them. Antiphlogistine is better if conditions indicate a poultice. If put on hot it is soothing, does not require changing oftener than once in twenty-four hours, and is not so heavy. There are serious objections to its use, however. Satisfactory examinations cannot be made through it. Conditions of collapse, when a quick-acting counterirritant to the chest is needed, are liable to come up at any time in broncho-pneumonia, and no other application can be used while the antiphlogistine plaster is on. It prevents bathing and interferes with sponging. If carelessly applied it will interfere seriously with the movement of the chest wall. I saw a child almost smothered by this plaster spread upon cloth and applied smoothly around the chest. If first spread upon cloth, have it in sections and allow the cloth to wrinkle longitudinally with the body. I often use it and believe it frequently does good, but I avoid it if I can, because of the expense and the reasons given. I think mild mustard paste applied when indicated just long enough to redden the skin is a life-saver in this disease. A milder but useful counterirritant is the well-known camphor oil and turpentine liniment used by saturated flannel cloth to the chest.

Stimulation is required more or less in every case of broncho-pneumonia; not simply because the patient has this disease, but because at some time during the attack quick assistance will be needed. If digestion is good, and the general conservative measures suggested have been carried out faithfully, less stimulation will be required, but the conditions demanding it may arise even at the beginning, but particularly toward the latter part of the attack; and when so demanded stimulants should be administered for a definite purpose and continued until that purpose has been accomplished. At the risk of frequent repetition I desire to emphasize the necessity of being constantly on the watch for so-called pulmonary collapse, and its energetic treatment when it does appear. It is characterized by high fever, more or less cyanosis, pale, clammy skin, stupor, absence of cough, quick, shallow respiration, cold extremities, dyspnea and weak, rapid and irregular pulse. If quick reaction is not obtained, the symptoms increase in severity, the stupor deepens into coma, and the little one gently drifts across the line and is gone.

Failure of respiration is a more frequent cause of death in this disease than cardiac failure, and cyanosis is as a rule the first danger signal of the condition just described. The object of treatment must be the stimulation of respiration, heart and peripheral circulation. The remedies to be used are hot mustard baths, atropin, strychnin, whisky, nitroglycerin, strophanthus and sometimes digitalis; the latter is too hard on the stomach to use frequently. Time does not permit nor is it necessary to minutely describe the special indications for each. The condition of patient will govern the choice, and results obtained will dictate dosage required. The quick action and prompt results obtained by administering some of these remedies hypodermically may make the difference between success and failure, life and death; therefore, do not hesitate to use the syringe, though you will find most mothers will object seriously.

SOCIETY PROCEEDINGS

CHICAGO PEDIATRIC SOCIETY

A regular monthly meeting was held October 18, 1904, with the President, DR. SAMUEL J. WALKER, in the Chair.

SYMPOSIUM ON SUMMER DIARRHEAS OF CHILDREN.—This was the subject for discussion. Dr. A. C. Cotton read the first paper, in which he presented a review of recent literature on summer diarrhea. Among other things, Dr. Cotton stated that dysentery had been known as far back as the fifth century. The characteristic lesions and repair had been described, showing that autopsies had been made. Endemic, epidemic and sporadic dysentery had been reported. Almost nothing except the geographical distribution was added until the discovery of the ameba coli or dysenteriæ in 1875 by Losch. In an epidemic in Japan, in 1898, in which there were 1,900,000 cases, and a mortality of twenty-five per cent., the Shiga bacillus was discovered by a Japanese physician. Discoveries followed in other countries.

The 1903 report of the Rockefeller Institute for Medical Research in New York being the most available and comprehensive work on the subject at present, the author extracted from it many points of interest. Duval and Bassett, at the Wilson Sanitarium, Baltimore, found the bacillus of dysentery in forty-two out of fifty-three cases of diarrhea examined, and they did not find it in healthy children.

Knox found the bacillus in eighteen cases in which no blood or mucous was found in the stool. The bacillus has been found in winter as well as summer diarrhea. The New York Hospital found it in 78 per cent. of the cases examined, the New York Health Department found it in 53 per cent., Bellevue Hospital in 51 per cent., Johns Hopkins in 40 per cent., Boston Floating Hospital in 93½ per cent., and the Philadelphia Children's Hospital in 52½ per cent. In thirty-two cases, ten of which were winter cases, no difference was found, due to the time of the year. The organism was found nowhere except in the bowel or stool. It had been found in all types of diarrhea. In an epidemic in Montreal in 1903, in which there were 812 deaths, neither the Shiga nor Flexner bacillus was found, although bacteriological work was said to have been done. At Bar Harbor, Me., last summer, under good hygienic conditions, quite an epidemic occurred. Dysentery bacillus was found in many of the cases. In a town of 3,000 inhabitants in New York there were 300 cases, with six per cent. mortality. The bacillus was found in many of these cases, Albany, St. Louis, Washington, D. C., Indiana all show fair per cent. of cases in which the bacillus was found.

BACTERIOLOGY.—Dr. George H. Weaver, bacteriologist of Rush Medical College, spoke on some bacteriological observations in connection with summer diarrhea. He presented charts showing results of cultural work. He said that in 102 cases taken from the sanitarium at Lincoln Park during the last summer, seventy-six were negative, and twenty-seven yielded the dysentery bacillus. He touched on the history of the dysentery bacillus, and the difficulties in the attempt to differentiate the organism. As the result of experiments, the tendency is now to group instead of individualize—for instance, one group has a certain action on dextrose only—another on lactose only, etc. Flexner founds his classification on the fermentation of dextrin; others have other bases of classification. There are two general groups, the acid or mannite, and the non-acid. Shiga is used as a broad term to cover all the non-acid group. In Constantinople a bacillus was isolated, which produced acid in milk and the characteristic dysentery lesions in cats, but seemed more like the colon bacillus. Other investigators have found the characteristic lesions of dysentery caused by different organisms, so that the opinion now in general is that dysentery is a clinical picture and not an entity. Specific agglutination also is losing a good deal of its value. The Widal test has not so special a significance as it did have. The reaction is not specific in dysentery, either, as it gives the reaction fully as well in typhoid fever as in dysentery. Duval and Bassett record agglutination in forty-two out of fifty-three cases of dysentery, and Wolfstein thirty-nine out of one hundred and forty, but the agglutination was not present until after the anti-dysenteric serum was administered. Flexner found it in the Rockefeller Institute in 270 out of 412 cases. Anti-dysenteric serum was used there, but it is not known whether it was used in all these cases. Dunn, in Rotch's clinic, found it in ten out of sixty-one cases. They threw out all cases not agglutinated by the anti-dysenteric serum. If the dysenteric condition does not exist, it is wrong to use the serum. If not needed, it would be a disturbing element and might do harm. In the seventy-six negative cases, 27,050 colonies were made. Of the twenty-seven cases, showing the dysentery bacillus, seventeen gave the bacillus Y. This distinction has not been made in other reports. The true Shiga bacillus was not found at all. The organism produces different action on glucose, maltose and dextrose, and on different culture media, so that its isolation may depend upon conditions. Miller, of Toronto, examined fifty cases of intestinal flora after death. In ten of these the bacillus pseudo-dysenteriæ was found, but it could not be agglutinated by the anti-dysenteric serum, this being the only difference.

The question is, which are and which are not dysenteric bacilli? So unlimited numbers of cultures must be examined. Duval examined the milk stools of healthy babies, and found the dysentery bacillus in two cases, both culturally and by agglutination. In a large part of the cases of summer diarrhea the dysentery bacillus was not found, or only in small numbers. Probably the ordinary cases of summer diarrhea are not due to the dysentery bacillus, but to various bacilli. Epidemics may be due to the dysentery bacillus. In the controls the agglutination occurred in a dilution of one to 400 sometimes, but usually in one to 200. Blood serum from scarlet fever and convalescing typhoid fever patients both agglutinated in the same dilution as blood serum from the dysentery patient, showing that dysentery is not a specific infection.

CLINICAL.—Dr. May Michael read a clinical report of the 102 cases examined by Dr. Weaver, giving the age, diet, character of stools, range of temperature, complications and termination of the cases. Mucus and blood were found in all but two of the cases in which the dysentery bacillus was found. The bacillus was not found in any case under six months of age, the largest number being between one and two years of age. The most of the cases were artificially fed. Four in the twenty-seven cases in which the dysentery bacillus was found died, but recovery was the rule. Rickets, pneumonia, bronchitis, marasmus, whooping cough, were the most common complications, but many of the cases were in good physical condition at the outset of the diarrhea. The anti-dysenteric serum was used in one case, with no result.

Dr. John C. Cook reported eighteen cases, in none of which was he able to isolate the dysentery bacillus, and none gave a clinical picture of dysentery. He found in cultures from the throat or stools one or more of the following organisms: Diplococcus, lactic acid, pneumococcus, typhoid, sarcina, yeast, a short, thick bacillus, and a long, slender bacillus. The clinical symptoms were varied. There were complications of marasmus, brought on by improper feeding at home, and especially pneumonia. Five died, two of pneumonia, one of typhoid fever, in which the Widal test was positive. Anti-dysenteric serum was used in one case without result. One case recovered, in which the organisms contained in its stool injected into a guinea pig caused its death.

Two cases, one the typhoid fever case, and another reported by the nurse as having had two severe hemorrhages from the bowels, showed in culture a pigmenting organism staining the media a red color. The suggestion was advanced that the color in the stool might be due to the action of this organism on the mucus. The stool did not color water as blood does. The bacteriologists working for Dr. Cook, Mr. Gill and Mr. Bain, of Northwestern University Medical School, hoped to name this organism some day. One case that died, at post-mortem showed bronchopneumonia, that could not by physical examination, pulse

EDITORIAL

A MEMORABLE MILE-STONE IN TERATOLOGY

"The Pathology of the germ is the *Hinterland* of Antenatal Pathology. Like a great continent or island the subject lies facing the four seas." These are the opening words of a chapter in a recent work by Dr. J. W. Ballantyne on Antenatal Pathology and Hygiene,[1] which is a marvel of completeness and a book of more than passing interest to the student of pediatrics who would approach the subject of teratology in a truly scientific manner.

"In studying the pathology of germinal life it is very necessary to bear constantly in mind one serious limitation to which it is subject." Behind all the conclusions that one drawn in reference to the physiology and the pathology of human germinal life, there is always the element of uncertainty arising out of the circumstances that such conclusions are mainly founded upon the phenomena of germinal activity as they are met with in the lower animals."

Notwithstanding this drawback, it is evident from the book before us that the larger and wider interpretations of comparative biology have been as an open book to the author and the result is most pleasing.

It is of interest to see "Maternal Impressions" treated at great length as one of the theories of teratological causation, and treated in a highly scientific and most suggestive manner. The history of its development throughout the ages is most full and entertaining and the outliving of the ancient beliefs of maternal and paternal influences are most interesting. It is smile provoking to find that we owe it to Galen that enlarged artistic sense that the soon-to-be-a-mother takes on, whereby her boudoir is fitted out with artistic surroundings to thus mould the budding perceptions of her young hopeful. We had really thought it a much more modern fact and one temperature or respirations, be determined during life. Most of the deaths were due either to pneumonia or to toxemia, resulting from improper feeding.

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[1] William Green & Sons, Edinburgh.

Dr. William J. Butler reported ten cases from Cook County Hospital, in all of which the anti-dysenteric serum was used, without results in any case. All these patients had blood and mucus in the stools, but in only two was the dysentery bacillus found. Clinically, the cases varied, but the stool was usually green, the temperature high, and the pulse and respirations rapid. One patient improved while using the serum, but the improvement was thought to be due to the use of calomel and whey rather than to serum. One patient on milk and barley water diet showed no change in temperature, pulse or stool for five days under the serum treatment, but improved in very respect when diet was changed to albumin water.

coming from Boston, but now it goes back to Galen, and as he was a great borrower, probably antedates him.

We thus welcome this treatise as a worthy successor to the author's first volume and commend it most highly to our readers who are interested in teratology as seen from its most intricate aspects.

ABSTRACTS

Acute Rheumatism in Children.—HERMAN B. SHEFFIELD (Post-Graduate, September), says that the nature of rheumatism is still shrouded in mystery. New views are being daily advanced, but none seems to meet general acceptance. Those who hold that acute rheumatism is an infectious disease certainly have sufficient ground for their belief. Like other infectious diseases acute rheumatism is most prevalent in certain climates and in certain seasons of the year. Acute rheumatism presents a prodromic stage of varying duration, which is characterized by chilliness, general malaise, etc. Like eruptive fevers it is manifested by general febrile disturbances with local lesions. To a certain extent it is self-limited, inasmuch as the local symptoms "jump" from one place to another—the persistence of the local involvement depending upon the fertility of the soil; in other words, the symptoms disappear from the affected part as soon as a sufficient quantity of antitoxin has formed to neutralize the toxin, *i. e.*, to render the affected part immune. Furthermore, acute rheumatism yields promptly to specific medication—in this respect resembling malarial fever. With these observations in view it is rather surprising that the "infectious theory" of acute rheumatism has not as yet received due recognition by the profession. Quite a number of eminent authorities still cling tenaciously to the "disturbed metabolism" theory *per se*, and in proof of it cite particularly the fact that during an acute attack of rheumatism there is an excessive excretion of lactic acid. T. J. Maclagan, who has studied this question very thoroughly, maintains that this phenomenon is the effect rather than the cause of the disease, and deduces several proofs in support of his view. Rheumatism, he says, is a disease of the motor apparatus of the body. Acute rheumatism is essentially an acute inflammation of the most active parts of that apparatus. The tissues chiefly involved are the muscles and fibrous textures. The rheumatic process must, therefore, be accompanied by increased metabolism of these textures. White fibrous tissue contains only nitrogenous material, muscle contains both, nitrogenous and non-nitrogenous. Its non-nitrogenous material is glucose; and from this lactic acid is formed. The difficulty has been to account for the increased metamorphosis of glucose, as evidenced by the increased formation of lactic acid. The theory, however, that the rheumatic process is due to a bacterial poison disposes of this difficulty. This poison is reproduced in the muscles and fibrous textures. By seizing on the constituent elements of these and appropriating them in its growth and reproduction, it causes in these textures the same increased metabolism that naturally results from increased functional activity. In doing this it necessarily causes increased formation of their ordinary products; one of the metabolic products of muscle is lactic acid. Increased formation of lactic acid is, therefore, one of the *results* of the rheumatic process. It results from increased metamorphosis of non-nitrogenous elements of muscle, just as increased formation of fibrin results from increased metamorphosis of nitrogenous elements. The correctness of this view is strikingly corroborated by the fact that in children in whom involvement of the musculature of the motor apparatus during an attack of acute rheumatism is either less pronounced than in the adult or entirely absent, the excretion of lactic acid is correspondingly much less marked.

With the "lactic-acid-theory" eliminated, the discovery of the rheumatism-producing micro-organism ought to be a matter of the near future. Indeed, judging by the experiments in this direction, it is more than probable that the detection of the rheumatism microbe is a settled fact. Poynton and Paine, for example, have obtained a diplococcus in pure culture from human rheumatic lesions and have reproduced by intravenous inoculation in the rabbit: endocarditis, pericarditis, carditis, pleurisy, pneumonia, nodules, and a nervous condition resembling chorea, as well as polyarthritis and inflammation of the sheaths of the tendons, and found the same organisms in the induced lesions. They also found the diplococcus in a culture from a "sore throat" in a patient with muscular pain, a history of a previous attack of rheumatic fever and valvular disease. It was isolated and cultivated and was injected intravenously into a rabbit, producing in that animal mitral valvulitis and great dilation of the heart. This observation and the fact that sore throat so commonly occurs as an early symptom of acute rheumatism, tend to show that, in this disease as in similar infectious fevers, the usual point of entrance of the virus is the tonsil or the pharynx. In children this symptom is sometimes accompanied by torticollis and vague muscular pain, which latter is frequently erroneously looked upon as "growing pains." The onset of acute rheumatism in children is generally slow and free from grave manifestations. It very rarely begins with cerebral symptoms, such as vomiting, convulsions and hyperesthesia. Pronounced articular symptoms are only rarely met with in young children. Not infrequently the affection is limited to one joint. In this event the disease is apt to be mistaken for other infectious fevers, for example, influenza, in which condition monoarthritis is not of rare occurrence. The articular involvement gives rise to symptoms identical with those observed in the adult, *i. e.,* stiffness, swelling and lameness. These symptoms are ordinarily milder in degree and shorter in duration. Occasionally, however, the course is protracted and may lead to the suspicion of incipient tuberculous arthritis. Sometimes there is thickening of the bones, due to rheumatism of the periosteum. The latter may become quite sensitive and give rise to the suspicion of incipient osteomyelitis. Rheumatism may also affect the muscles. The children suddenly cease to use the affected limb and perceive pain on motion or on pressure. This condition involving the muscles of the hip is very apt to be mistaken for coxitis. Endocarditis as well as pericarditis are especially frequent complications of even mild attacks of rheumatism. Indeed in some cases endocarditis is the first symptoms of rheumatism, the articular affection not developing until a few days later. The endocarditis, however, may remain latent for a long time, and cause no symptoms even after severe exercise. On the other hand, the endocarditis may sometimes run a very violent course, and give rise to hypertrophy of one or both ventricles within a few months after the rheumatic attack. Pericarditis usually sets in quite early in the majority of the cases complicated by it. It is manifested by a serous exudation which may rapidly disappear and escape observation. Often, however, a distension of the area of cardiac dulness remains which may increase or diminish, showing that fluid is undoubtedly present, or that dilatation has already developed. Children sometimes complain of abdominal pain during the course of rheumatic fever, and the abdomen is not infrequently sensitive to pressure. In the majority of such cases, however, there is no involvement of the peritoneum. It can thus be seen that rheumatism is also in children quite a grave affection and requires active treatment, particularly in order to prevent serious complications. Rest in bed is the most important therapeutic measure in this direction, and should be enjoined during the entire course of the disease. The so much talked of "dieting" in acute rheumatism is, in our opinion, nothing but a myth. As shown before, acute rheumatism is an infectious and not a "dietetic" disease; the diet can, therefore, bear no influence upon its course. During the febrile stage, the diet should, of course, be limited to the ordinary "fever diet," *i. e.,* liquid easily digestible food. Medicinally the salicylates act specifically n this condition. Enough of the drug should be given to neutralize the rheumatic poison, and it should be continued until every vestige of the disease has dispeared. Caution, however, is commended in the administration of salicylates for fear of disturbing digestion and depriving the patient of nourishment requisite for the maintenance of life. To avoid gastric disturbance the salicylates combined with small doses of pepsin or ingluvin, or preferably resort to aspirin acetylsalicylic acid), which passes unchanged through the stomach, and hence is not apt to produce gastric disturbance. For a child six years old he ordinarily prescribes aspirin, or the salicylates obtained from the wintergreen plant, in doses of five grains, to be repeated every two hours the first day and every four hours the following days.

For the relief of articular pain and swelling the joint should be enveloped in absorbent cotton wrung out of a warm saturated solution of bicarbonate of soda. The compress should be covered with oiled silk and flannel bandage and changed as soon as it becomes dry. After disappearance of the acute symptoms, the stiffness and lameness—if there be any—generally yield to gentle massage with the following ointment.

℞—Olei Gaultheriæ....................
Ichthyolis ....aa ʒi
Lanolini .... ℥i

It is, perhaps, needless to add that the massage should not consist of the kind of manipulations the humorous Simeon Ford speaks of: "disjointing, dismembering, bruising and rendering limb from limb." In children especially massage should be practiced with particular care. Later on it is advantageous to supplement the local treatment by gentle general massage. The cardiac and other complications arising must be treated according to indications. The iodides particularly should not be lost sight of in protracted cases.

Diphtheria.—WILLIAM F. WAUGH (Medical Summary, October), says that the efficacy of antitoxin in the treatment of diphtheria has been demonstrated so completely, that at the present day no practitioner is justified in failing to avail himself of this potent remedy. But it has likewise been shown that its efficacy is greatest at the beginning of the attack, and diminishes with its progress; so that by the fourth day antitoxin fails to cure in a large proportion of cases. We who practice general medicine, however, know well that parents often fail to call us in the earlier stages of this insidious malady, and we are first brought face to face with our enemy when antitoxin has become comparatively inert. This is the excuse an old-fashioned doctor has for giving a few suggestions on old-fashioned methods of treating this disease. Excepting the laryngeal implication, no extension of diphtheria is more to be dreaded than that into the nasal tract. First appears an insignificant little coryzal discharge; this increases, and the child complains of its burning. The secretion increases in quantity as the affection spreads through the succulent Schneiderian mucous membrane, which becomes a roaring furnace of disease, the discharge excoriating the nostrils and lips, which are immediately attacked by the infection. The stench is awful. I have known strong men faint on entering the room where the child lay sick. The child is depressed, the pupils contracted, the pulse thready and rapid, the forehead burning hot, the extremities cold, the mind sluggish, the vital forces overwhelmed by the accumulation of noxious matters absorbed into the blood from the affected tissues. Here is a beautiful opportunity to demonstrate the vital difference between sepsis and sapremia. Wash out the nasal tract with an antiseptic solution, hydrogen peroxide or chlorinated soda, till all is clear, note the surprising results. The pupils become normal, the pulse likewise; the heat disappears from the forehead and returns to the nose and extremities, the stupor lifts, and with a bound the vital forces react. The child sits up and calls for food and its toys, perhaps wants to climb down to the floor and play, or to go out doors. Soon this revival wanes, and the former condition reappears. It is appalling to see with what fateful speed diphtheria progresses. One can almost see the membrane grow before the eyes. But this only calls for a renewal of the cleansing operation, which should be repeated as fast as the malady indicates. It has been my practice to require the cleansing every fifteen minutes while the patient wakes and every half-hour during sleep. Diphtheria never sleeps, and while a fatally tender nurse allows the child to enjoy its much-needed rest, the malady silently tightens its grasp on the victim, overcomes the vital resistance and extends its invasion beyond the reach of local medication. In reality there is little difficulty in applying the requisite remedies. The intense burning induces the child to crave eagerly the cleansing antiseptics that relieve it; and when awakened for this purpose, it falls asleep almost immediately when the cleansing and medicating are done. At the first appearance of the ill-omened coryza, injections of silver nitrate, five grains to the ounce of water, will often check the spread of the infection. Later, hydrogen peroxide answers, if used as strong as the tissue will bear. But any antiseptic solution will answer if used strong enough and often enough.

Epistaxis.—The writer's experience with diphtheritic epistaxis is simple, and to him convincing. Up to a certan period every case he had perished; after that every case recovered. The dividing line was marked by the introduction of chromic acid. As soon as a tinge of blood appears in the coryzal discharge, syringe the nostril whence it comes, with a little chromic acid in water, just enough to give it a pink tinge. When the sanguinolent flow reappears, whether in a few minutes or in some hours, repeat the application, but a little stronger; and so on till the strength is sufficient to seal up the open vessels that stop further erosion, or rather capillary oozing. One more duty remains to the doctor, and this of an importance it is impossible to exaggerate. See that the hygienic condition of the house is made and kept perfect. Herein lies the source of malignity, and in the removal of disease-breeding dirt lies the secret of success. Is there any remedy that administered internally controls the manifestations of diphtheria? A ray of hope came, when it was announced that in calcium sulphid we had such a boon. Later reports, however, told of its failure, in those malignant cases wherein alone such a remedy is required. But at this time we were hampered with a dread of this agent, which subsequent experience has shown to be unfounded. It was said that sulphydric acid reduced the hemoglobin, and obstinately refused to be displaced. And so we timorously administered calcium sulphide in hourly doses of gr. 1-10, ready to quit at the least suspicion of danger. But a bolder therapeusis has changed this. Now we give a child up to two grains every hour, of the best and most active sulphide obtainable, and we get corresponding results. It is claimed by those who have had most experience with this remedy, that it is a true internal antiseptic germicide; no micro-organism will live in the human body when once saturated with it until the breath and skin exhale its characteristic odor. Intestinal parasites leave the bowels when this occurs, and neither the mosquito nor any other insect pest will attack a person thus saturated. Thus given, the remedy appears to be perfectly harmless to children of any age. Surely if the half be true that is claimed, this drug deserves restudy in diphtheria, in the larger doses now recommended. With it and the local treatment outlined, we will save nearly all the cases, in which the man who believes in nothing but antitoxin folds up his tent and departs, leaving despair and death behind. And the method fills the needs of those who cannot bear defeat, but believe in fighting to the last. It is absolutely necessary that the sulphide shall be active. It seems a difficult drug to handle pharmaceutically. Much of that found in the shops is inert, not even possessing the characteristic odor. One manufacturing house, after vainly trying to compass the task of producing an active and stable sulphide, gave it up and struck it off their list.

Possibly some others might display a similarly creditable honesty with advantage. From first to last the heart must be scrutinized closely. It is advisable to begin at the first to strengthen this weak point by administering strychnine arsenate in doses of half a milligram, gr. 1-134, every two to four hours, to a child five years old, the dose being regulated so as to secure and maintain normal cardiac vascular tension. Keep the bowels clear and clean. It is no part of the wise man to clean up the premises and leave masses of putrefying matter within the body. Nothing in the way of diet that aids in sustaining vitality and combating infection should be neglected. If there is a possibility that Nuclein does this, it should be given in full doses. My own impression is that it is of value; but the tremendous importance of the local treatment described, makes me chary of emphasizing internal remedies, lest the reliance placed on them lead to neglect of the local measures.

Nephritis in Infantile Scurvy.—George F. St‘ll, M.A., M.D., F.R.C.P. (Lancet, August 13, p. 441).—The occurrence of hæmaturia in infantile scurvy is well recognized. When hæmaturia is not present, a trace of albumin in the urine apparently may represent a slighter degree of the same abnormal vascular or blood condition, whatever it may be, which causes the hæmaturia. Both these abnormal characters of urine are commoner than has been supposed. The writer finds that it is the rule rather than the exception that the urine in pronounced infantile scurvy contains either a trace of albumin or blood. But this hæmaturia is evidently simply part of the general hemorrhagic tendency of scurvy; there is nothing to suggest that it is due to nephritis; the urine is not characteristic of renal inflammation, and when albumin is found without blood there is almost always so little that it is not *per se* evidence of nephritis. The two cases recorded here seem to be of interest as showing, so far as can be shown from clinical evidence alone, that infantile scurvy may produce not merely albuminuria or hæmaturia but actual nephritis. *Case* 1.—A girl, aged 11 months, had been wasting for some months. For eight months before the wasting began she had been fed on unsweetened condensed milk, and for the last two months on fresh milk boiled and mixed with Allenbury Food No. 3. When seen on February 10, 1903, she was much wasted, the skin was sallow and very dry, the legs looked "puffy," especially over the feet, but there was no definite pitting on pressure. There was no tenderness of the limbs, which were moved freely. There were two upper and two lower incisors, and the gums around were greatly swollen and deep violet-purple. The urine was slightly red, showed many blood corpuscles, some leucocytes, and on boiling with acetic acid there was "a moderate cloud of albumin." No casts were seen. On February 19, after eight days of treatment with potato cream, orange juice, unboiled milk and raw meat juice, the gums had almost entirely lost discoloration and were much less swollen. On the 20th the urine was no longer red, and only a few blood corpuscles were found with the microscope. In spite of this diminution, however, the albumin had greatly increased and formed a flaky precipitate on boiling with acetic acid. Microscopic examination showed many tube-casts, granular, hyaline and epithelial. Although the scorbutic condition of the gums was so much improved and the general condition decidedly better there was still considerable illness, and the skin remained dry and harsh. There was never any œdema at any time. On the 26th the urine still contained much albumin; with the microscope blood corpuscles were found with difficulty, the number of tube-casts was fewer, but hyaline and granular casts could still be found easily without centrifuge. The infant was now much better in every way. On March 4 she seemed quite recovered from the scurvy, but there was still "a cloud of albumin," on boiling with acetic acid. Thereafter no casts were found, but a slight cloud of albumin persisted; and when last observed, sixteen months after the scurvy, there was still a constant trace of albumin in the urine. *Case* 2.—A boy, aged eight months, came under observation. He had been fed on Allenbury's food since the age of four weeks (except for a period of six weeks, during which he had Benger's food made with cow's milk). The Allenbury's foods had been continued until a fortnight previously, when sterilized milk was given and a little raw meat juice. One month before he was seen the feet and legs became tender, and he did not move the legs about. A fortnight before the left eye suddenly showed swelling and redness of both lids, which a few days later had the appearance of "a black eye." On April 28, when he came under observation, there were marked proptosis and outward displacement of the left eye. He cried piteously when the legs were moved. There was slight hemorrhage in the gum behind the one lower incisor which was present. He was pale and seemed ill.

Treatment was begun at once with potato cream, orange juice, etc. On May 3 the urine gave on boiling with acetic acid a flaky precipitate of albumin, which was evidently much more than could be accounted for by the few blood corpuscles discovered by the microscope. Many casts, epithelial, granular and hyaline(were seen without centrifuge. On the 8th all the tenderness of the limbs had gone, and the proptosis was much less. On the 20th the urine obtained showed no blood but some albumin, and still epithelial and granular casts, but not nearly so numerous as before. On the 23d the urine still showed a definite cloud of albumin on boiling with acetic acid, but there were no casts. The infant now seemed quite well. On June 9 there was still a trace of albumin in the urine, but no blood and no casts.

Perhaps the most noteworthy feature in these two cases was the latency of the nephritis. Apart from examination of the urine there was nothing suggestive of nephritis. This, of course, is not peculiar to nephritis with scurvy. The acute stage of the nephritis, as judged by the quantity of albumin and the presence of casts, was of short duration in both cases; in the former casts had disappeared within twelve days after the onset of nephritis; in the latter they were absent twenty days after the renal affection was first noticed. In both cases a trace of albumin persisted long after all symptoms of scurvy, in the former case for at least sixteen months.

Pediatrics at the International Congress of Arts and Science.—The section of Pediatrics went into session on September 21, 1904, the chairman being Professor Thomas M. Rotch, of Harvard University. The first paper was one by Professoı Theodor Escherich, of the University of Vienna. This was followed by a paper by Dr. Abraham Jacobi, of New York, on "The History of Pædiatries and Its Relation to Other Specialties." In this paper the speaker reviewed the rise and progress of pediatrics. Upwards of 7,000 works had been published on the special diseases of children before the year 1849, some of the earliest dating back to the fifteenth century. The study of diseases of children was combined in this country with that of diseases of women until a special clinic was started for the former by the New York Medical College in 1860. A clergyman, the Rev. Thomas Thatcher, printed a treatise which dealt to some extent with this subject, during colonial days. The rise of special interest in this class of diseases seemed general, for Europe enriched medical science with brilliant literature on the subject about the same time that pediatrics began to be differentiated as a special study by the New York Medical College. From the eighteenth century the literature of pediatrics had gone on increasing, until at the present time periodicals devoted to this subject existed to the number of five in Germany, two in France, and two each in Italy and the United States, Spain also producing one. Special societies had increased in similar proportion. Institutions for the care of sick children took their rise in the establishment of Dr. Armstrong in 1769. The largest children's hospital in Europe was the Hospital des enfants malades, established during the French Republic, 1802. There were now such hospitals scattered throughout the entire civilized world. The author next dwelt on the gradual evolution of infantile life from conception onward, and laid stress on the influence of heredity, which, he asserted, did not necessarily imply the presence of fully developed disease, but might equally be evidenced by mere dystrophies, such as obesity, hyperplasia, or atrophy, which might all be inherited, or by a tendency only to degeneration. Social influences operated largely in the production of degeneracy, as, for instance, when the maintenance of a great standing army prevented the marriage of the sturdier portion of the community, leaving the propagation of the race in the hands of those whose sedentary lives tended to the production of an inferior race. A similar result followed on severe wars, for the sound and physically fit were slain in large numbers, while the defectives from a physical point of view remained at home to propagate the species. The evolution of the living being could not be understood apart from heredity; moreover, it was an essential to the comprehension of many diseased conditions. The relation of pediatrics to obstetrics appeared in the fact that even to-day, with all our modern methods of reducing infantile mortality, three per cent. of mature living foetuses failed to attain postnatal life. The author next considered many conditions encountered only, or most frequently, in the child, as, for instance, the ear troubles, otology being mainly a specialty of the young. Ophthalmology and dermatology, likewise, had close relationships, while the relation of pediatrics to legal medicine was indicated by the immense literature on infanticide in every language. As causes of the excessive infant mortality, the author instanced the parental conditions (illness or poverty), illegitimate births, artificial feeding, popular ignorance in regard to food and hygiene, exposure, lack of medical aid, general neglect and carelessness, and infanticide. The influence of diet on the mortality was shown by the fact that the mortality of babies fed on cow's milk was six times that of infants fed at the breast.

The author laid stress on the fact that chemistry was not physiology, and that apparent chemical identity did not necessarily indicate physiological identity. Hence the fact that the nursing bottle, even when the milk was labeled "modified" or "certified," was not the same thing exactly as milk from the human breast. In the realm of therapeutics, the speaker instanced electrotherapeutics as having been greatly enhanced by the labors of obstetricians, pediatrists, and general practitioners. The prevention of congenital malformations was one of the therapeutical problems of the future. The author next referred to the influence of syphilis, heredity and consanguinity in the causation of malformations. In the case of older children, other factors besides food entered into consideration, and particularly the school question. The speaker cited with approval the examples of Bulgaria and Hungary, in both of which countries every school had its physician. It should never be lost sight of that increased mental power went hand in hand with greater physical development, increased weight, and a larger breathing power. In the pathology of the nervous system the lessons that might be derived from the foetus and the infant were essential to completeness. The pediatrist, the pedagogue, the psychiatrist, the judge and the statesmen, were all equally interested in the influence of heredity. As to insanity, there was a much greater number of insane children than the statistics of lunatic asylums would appear to indicate, for only a small proportion of such children were in such institutions. The speaker entered a protest, however, against the grossly exaggerated notions of degeneracy brought about by the doctrines of Lombroso and his school. He spoke of the young as the owners of the world, and said that their future development would decide whether the world was to become more criminal or more righteous. The physician, and especially the pediatric physician, were principally responsible for their proper training, but no matter what progress they made there would always be new problems for future ages to solve.

How to Feed a Baby Deprived of the Breast.—Dr. William P. Northrup, of New York, said that it was useless to talk of the use of goat's, ass's or mare's milk for the feeding of infants in America. Cow's milk alone was practicable, and must be the basis of infant feeding. In the preparation of it it was essential to have a clean, dust-free laboratory and skilled service, all of which could not be had without expense. To produce the best results the farm and laboratory must have a capable manager, an inspector, a chemist, a bacteriologist, etc. The prepared food must be as nearly as possible like the human breast milk. But breast milk varied and did not always agree with the child. Cow's milk had been found to contain double the quantity of proteids and the same amount of fats as was found in breast milk, and the first problem to be solved was how to dilute the proteids and retain the fats. That was solved by first removing all the fats, then diluting the proteids, then returning the fats to the milk. The function of the milk laboratory was to fill prescriptions. The physician could know exactly what the infant was taking, and could know what element disagreed. In that way milk could be modified to meet the demands of the individual child.

Dr. Rotch called attention to the fact that one of the greatest drawbacks in the matter of milk modification was the commercial side of the question, but that had nothing to do with the principle involved in the percentage system. The laboratories must always be out of the hands of commerce and under the care of scientific investigators.

Intestinal Occlusion in Infancy and Childhood.—Dr. Edward Saunders, of St. Louis, read this paper. He considered that the subject had not received the attention it deserved. In the textbooks the information was misleading. One of these referred to it as a dilatation of the stomach due to rhachitis. Dr. Saunders reviewed the etiology, symptoms and treatment of the condition.

Pneumonia in Infancy.—This paper was read by Dr. John L. Morse, of Boston, who stated that infants were especially liable to the disease, because of the undevelopeed condition of their lungs. That, however, did not predispose to lobar pneumonia. The condition was most common in the early spring or late winter. Dr. Morse gave very full statistics on the mortality of the condition and reviewed the etiology, symptomatology and treatment.

On the Causation and Treatment of Incontinence of Urine in Children.—DR. JOHN THOMPSON, M.D., physician to the Royal Hospital for Sick Children, Edinburgh, presents a series of reports on this condition. He says the etiology of enuresis has always been a much disputed matter. Some regard it as a purely functional disturbance; some think that there is always a local disease behind the neurosis; and many take a somewhat intermediate view. The clinical varieties of the malady are generally admitted, theoretically, to be numerous. In practice, however, there is a strong tendency for the medical man to get into the way of classing the cases unscientifically into two groups—those which recover more or less rapidly under large doses of belladonna or atropin along with ordinary common-sense regulation of the diet and habits and the removal of obvious sources of irritation, and those which persist or get worse in spite of all such measures. This latter group is not a small one, and the cases which form it are such a frequent source of disappointment and humiliation to the practitioner that any fresh suggestions for dealing with them are well worth considering.

Far the most important recent contribution to the subject is that of Dr. J. G. Rey, of Aix-la-Chapelle. He has written a most interesting and instructive paper (Rev. d'hyg. et de méd. infant, T. iii. No. 2, 1904, and Berl. klin. Woch., August, 29, 1904) on the results of his experience in the investigation and treatment of fifty-two cases of enuresis in children which he has had under observation during the last five years. In these cases not only were the general symptoms studied, but the urine was fully examined microscopically, chemically and bacteriologically; and in the girls and older boys the cystoscope was used when possible. Rey is convinced that when there is no central nervous lesion or mental defect present, and no infantilism or athyria, the wetting is always primarily due to the presence of local disease or irritation of the bladder or of neighboring parts. The local disease or irritation may have passed off by the time the case is seen, but originally it was there. In cases where the local cause recovers in way this way but the enuresis continues, it is easy to see that faradism epidural injections, etc., may bring about a sudden cure.

One of the commonest and most important causes is *Latent Cystitis due to Bacillus coli.* This organism, as is well known, may produce acute or chronic febrile cystitis with turbid urine and a heavy deposit. The cases, however, referred to here are of a much milder type. In them the urine seems, on casual inspection, almost normal, or only slightly turbid. In nineteen out of his fifty-two cases Rey found large quantities of bacillus coli in the freshly-passed urine, which was generally acid and had a heavy, unpleasant odor. This latent form of coli-cystitis is especially common in girls, and is often responsible for their becoming pale, miserable and irritable, although free from any noticeable local symptom. When one remembers how little there is in the way of localizing symptoms in acute feverish cases of coli-cystitis, one cannot wonder that the latent form of the disease should very often be overlooked. The treatment of the condition consists in the persevering application of antiseptics to the whole of the urinary tract. Rey has found the internal administration of salol, along with strict milk diet and regular meals, to be better than washing out the bladder.

Another very important cause of enuresis is *Simple Mucous Cystitis.* In this also the symptoms may be extremely slight, and the urine only contains mucus, some epithelial cells and some leucocytes. It may sometimes be difficult to demonstrate any pathological constituents in it. This form of cystitis is often met with in badly-nourished, injudiciously fed and rickety children. It sometimes arises in connection with what is called "acid intoxication," in which the urine becomes ammoniacal and so irritating that it sets up ulceration of the prepuce and eczema in the gluteal region. This sort of urine is apt to cause simple mucous catarrh. When the symptoms are very acute the child may scream from pain on each attempt to empty the bladder, and he is often circumcised owing to the idea that his symptoms are due to phimosis. The child's distress can often be relieved, even within twenty-four hours, by regulation of the diet and the administration of salol. Out of Rey's fifty-two cases, twenty-four had this form of bladder-catarrh; and seventeen of these were boys. Even in older children the urine has often a markedly ammoniacal odor, contrasting strongly with the heavy, offensive smell which characterizes that of the coli-cystitis cases. In some cases there is a special irritation of the meatus and its neighborhood, which leads to marked constriction of its lumen. When this is present it greatly favors the continuance of the incontinence.

A less frequent cause of enuresis, which accounted for three of Rey's cases, is *Phosphaturia.* This may give rise to frequent micturition and enuresis when the urine is concentrated or when there are crystals of triple phosphate in it. It is best treated by a flesh diet and a diminution of vegetable food.

In one of the fifty-two cases there was a large *increase of uric acid* in the urine, which deposited numerous and large crystals when acidulated and allowed to stand. The incontinence was rapidly stopped by the adoption of a vegetable diet.

In three of the cases the enuresis was attributed to an *accumulation of smegma* about the corona glandis, owing to the persistence of the natural physiological adhesion between the glans and the prepuce. When this was separated, permanent recovery took place.

In the remaining two cases large quantities of *oxyurides* were present.

In beginning the treatment of a case of enuresis, any obvious general or local morbid condition which might be a cause of the condition is first to be dealt with. If none such is found, the urine must be searched for signs of urethritis or cystitis. In very many cases a proper ordering of the diet will cure, or at least greatly improve matters. What is best is usually a diet of four or five meals in the day of bread and milk or porridge and milk, and nothing else, especially no fruit or sweets.

Tonics are useful, and Rey recommends a mixture of condurango and hydrochloric acid before meals to improve the appetite and digestion. At the same time he gives fairly large doses of salol after food. These will have caused distinct improvement by the end of the week, and afterwards can be given less regularly, perhaps every alternate three or four days. In obstinate cases he adds strychnine. A moderate amount of hardening treatment by the administration of short douches or cold baths is also useful. It is very important to see to the child's clothing; he should wear long stockings, and the bladder region, as well as the legs, must be kept warm. Cold and wet feet are, of course, to be avoided, and damp and draughts generally are to be guarded against.

If after disappearance of the local trouble the enuresis persists, then is the time when the child may be the better of being seriously spoken to, and the application of faradism, massage of the prostate, epidural injection, etc., may also do him good. Raising the foot of his bed may sometimes help, and the frequent waking of the patient and making him pass water is advisable, not only as cultivating a good habit, but also because it helps to prevent his getting a chill from lying in wet sheets.

Dr. Percy Lewis, of Folkestone (Brit. Journ. of Children's Diseases, February, 1904), describes a type of cases of enuresis which he had found common, and in which he thinks that the trouble is *directly due to dietetic errors*. These children, he says, "are mostly unhealthy in aspect, being either anæmic, bilious-looking, or lymphatic. Their skins are dull, and inclined to acne or some of the low forms of eczema. They are generally not fond of meat, eat irregularly, and live mostly on farinaceous and saccharine foods. They are disinclined for exertion or school work. They have a sort of nocturnal polyuria, and pass seldom less than two pints of urine of low specific gravity in the night, and sometimes twice as much. The water is neutral or alkaline in reaction, with a deposit of triple phosphates or oxalates. Very frequently there is a trace of albumin. In the simple nocturnal cases the urine generally assumes a normal character during the day.

The treatment is mainly dietetic. In most instances a rigid antidiabetic diet removes the symptom in a few days. General tonic treatment is also given, and after three or four weeks an ordinary diet may be safely returned to.

MM. Genouville and Campani (Presse méd., May 11, 1904) regard enuresis as due to weakness of contractility of the bladder sphincter, and hold that its rational treatment, therefore, consists in *faradisation* of that structure. This they apply directly by means of a bulbous-ended bougie in the urethra in the case of older girls, and in the vagina in younger ones. In boys they find that the one pole may be quite satisfactorily placed on the perineum instead of in the urethra. They claim that this treatment, properly carried out, cures 55 per cent. of cases, and greatly improves another 25 per cent.

About three years ago Dr. F. Cathelin suggested the use of what he called *epidural injections* for a variety of derangements of the genito-urinary apparatus. The treatment consists in the injection of a quantity of normal saline solution into the sacral canal below the termination of the dural sac. Incontinence of urine was one of the maladies for which it was most strongly recommended. In a recent paper (Presse méd., March 26, 1904)

Cathelin gives a résumé of about twenty articles which have appeared on this subject in Continental and American literature since his first communication. His own further experience of the method has confirmed his opinion of its harmlessness as well as efficacy. He has made two thousand injections, apparently without any mishap.

Dr. G. Kapsammer describes his experience of epidural injection for enuresis in forty-five children treated in Professor v. Frisch's clinique in the Vienna Poliklinik (Arch. f. Kinderheilk., Bd., 38, H. 5, 1904). For the little operation, which is quite easy, he finds it best to use a metal syringe which can be thoroughly boiled, and a needle about 4 cm. long. He injects from 10 to 40 c.c. of saline solution at a time. The patient is laid, face downwards, over a wedge-shaped pillow, so as to elevate the sacral region. After the strictest antiseptic precautions have been taken, the needle is passed into the lower end of the sacral canal. The point chosen for entering is a little above the middle of a line connecting the ends of the cornua coccygea of the sacrum. These are easily felt unless the child is very fat. The needle is inclined at an angle of about 60 degrees to the skin, until it meets with the resistance of the front wall of the sacral canal. It is then turned gradually in a horizontal direction and passed up the sacral canal. Care must be taken not to pass the needle so far in as to puncture the dura. The manipulations must, of course, be very gentle, so as not to break the needle, and the fluid is to be injected very slowly. The puncture is closed with sterilized gauze and plaster, and the child may be treated as an out-patient. In none of these cases were there any unpleasant symptoms, except that occasionally pains were felt in the legs, and two of the children vomited.

The benefit of the injections is sometimes seen from the first; but even when this is so, it well to give at least three within a week before they are discontinued. Sometimes the improvement which follows the first injection lasts only a short time, but each subsequent injection produces a more lasting effect than the one before it. Occasionally an aggravation of the symptoms follows the first injection, but even in such cases improvement may set in later. Of his forty-five cases, Kapsammer reports thirty-eight as cured, five as improved, and two as having relapsed. Dr. Artur Strauss (Therap. Monatshefte, February, 1904), after a similar although smaller experience, comes to the same conclusions as Kapsammer. Both writers regard the epidural injections as a useful addition to the means at our disposal for treating obstinate cases of enuresis which have resisted other measures.

Another new method of treatment for obstinate cases of enuresis has been devised by Professor Jaboulay, and is described by Dr. J. Revel (Thèse de Lyons, abst. in La Clinique Infantile, July 14, 1904). This consists in the injection into the retrorectal connective tissue of large quantities of sterile *salt solution.* The justification of this proceeding is the idea that incontinence of urine arises from a functional disturbance of the sympathetic nervous system at the level of the hypogastric plexus; and the fluid injected is supposed to exert some sort of mechanical effect on the plexus.

For the operation a large syringe is required, and of course the antiseptic precautions cannot be too stringent. The patient lies on his side with the under leg and thigh extended and the upper fully flexed. Standing on the patient's left the doctor passes his left finger into the rectum to serve as a guide to the needle of the syringe. The needle is then inserted at the tip of the coccyx or a little to one side of it, and passed carefully up behind the rectum. From 100 to 150 c.cm. are introduced. The effect of the injection on the incontinence is said to be marked and immediate. The patient, who has been wetting the bed nightly, ceases at once to do so; and he may even have retention for several days. If a relapse occurs the injection must be repeated. Revel had three patients who were treated in this way with complete success.

Rheumatism in Childhood.—J. BURNET (British Journal of Children's Diseases, September, 1904).—It has been definitely ascertained that rheumatism is a disease which differs widely in its clinical manifestations as one passes from childhood into adolescence and again into adult life. Rheumatism is looked upon as a comparatively simple disease, but as a matter of fact it is very complex in its clinical manifestations. This is certainly true of the rheumatism of childhood. The hereditary factor is important in its production. Pharyngitis and tonsillitis deserve to be more frequently regarded as rheumatic than they are at present. Pneumonia is never looked upon as a manifestation of rheumatism, but the writer has recently had under his care a child of six years whose family history was strongly rheumatic, and who after the pneumonia cleared up showed unmistakable evidences of chorea. It is possible that some cases of pneumonia are in reality due to the specific virus of rheumatism. Psoriasis and rheumatism are related. This form of skin disease rarely occurs save in rheumatic subjects. Appendicitis, a fairly common disease in children, though its recognition is often missed in young subjects, is unquestionably sometimes of rhuematic origin. A symptom-complex to which the writer has given the name gastroenteric spasm, in which the child complains of pain after meals, is frequently of rheumatic origin, often improving under salicylate of soda when all other remedies fail. Pain in the side or upper part of the chest is often thought to indicate tonics, when as a matter of fact antirheumatics are the remedies which give immediate relief. Children of rheumatic heredity do not often present any definite manifestation of the disease; they are often nervous, irritable and quick-tempered. When this nervous restlessness reaches a certain point it is associated with muscular movements, at first slight, gradually increasing in severity until true chorea is established. In the treatment of rheumatism in children the best results are obtained from the administration of aspirin or salicylate of sodium. They must be given in large doses, and children tolerate these remedies better than is generally supposed. To a child of five years, ten grains of either remedy may be safely given every four hours for several days. Calomel is also a useful remedy given in one-half to three-grain doses three times a day. The heart requires special attention, and frequently cod-liver oil is indicated associated with the antirheumatic remedies.

Acute Myocardial Insufficiency in Some Infections in Children.—F. FORCHHEIMER (Archives of Pediatrics, September, 1904).—Myocardial insufficiency frequently develops in connection with the acute infections in childhood. These cases have an interest not only from the fact that they may terminate fatally during the course of the acute illness in which they are developed, but in cases which survive there may be heart weakness in early adult life. It is probable that the so-called idiopathic dilatation of the heart is not common, but is due to some myocardial change. The development of acute myocardial insufficiency depends upon the amount of damage done to the myocardium. Frequently during the course of the acute disease no symptoms develop, but after the fever has fallen the bad results of myocardial involvement are shown, due to a continuance of the process in the heart muscle. When a sufficient change takes place in the myocardium so that it becomes insufficient, then the case assumes a distinct clinical picture. At first there is a diminution in heart force and arrhythmia. Then follows dilatation of the left heart, then of the right heart, with relative insufficiency of the valves. As soon as the right heart is seriously affected there is marked enlargement of the liver. Diphtheria is by far the most frequent infection to be followed by myocardial insufficiency. Acute myocarditis occurs in from 10 to 20 per cent. of all cases of this disease, but fortunately not all of these lead to myocardial insufficiency. Next to diphtheria the most frequent acute disease leading to myocardial insufficiency is influenza and the septicemia which often follows it. In the treatment of myocardial insufficiency the first principle is absolute rest. Stimulants will be required in most of the cases, and the convalescence should be especially guarded. Mechanical treatments are of value in strengthening the myocardium. These consist of Swedish movements, massage and vibratory methods. Strychnine may be used for its general tonic effect. Nitroglycerin should never be used unless there are anginous attacks. According to the writer adrenalin has an elective effect upon the blood-vessels supplied by the splanchnic nerve, given hypodermically every two hours. Saline transfusions are given in the beginning to keep up the heart's contractions; ice-bags are also useful upon the abdomen, as they stimulate the splanchnic reflex. After the most severe symptoms have passed, caffeine and salicylates are given every two to four hours, alternating with adrenalin, which is gradually dropped.

Valvular Obstruction in the Urethra.—C. A. Morton (British Journal of Children's Diseases, August, 1904).—The case of a fourteen-months-old baby is reported who was sent to the hospital with a history of three months of wasting and vomiting with distention of the abdomen. There was a central hypogastric swelling suggesting a distended bladder, but as urine was passed in an apparently natural manner the catheter was not used immediately, but later it was employed and several ounces of urine removed, followed by a disappearance of the hypogastric swelling. Blood and pus were noticed in the urine during the next twenty-four hours, and the temperature rose. One week after admission the child died. At the post-mortem examination a dilated and hypertrophied bladder was found. The ureters resembled the small intestine, and both kidneys were hydronephrotic, but a considerable amount of renal tissue remained. The mucous membrane of the bladder was plum-colored from hemorrhage, and its surface contained an exudate. Hemorrhages were found in the pelvis of each kidney. A small valve-like fold was found in the roof of the urethra just beyond the vesical orifice. Its arrangement was such that it furnished a considerable obstruction to the passage of urine, but did not hinder the introduction of a catheter.

Acute Leukemia in Early Life.—F. S. Churchill (American Journal of the Medical Sciences, October, 1904).—The writer gives a careful study of a well observed case, and a résumé of the twenty-two cases reported. He says that all cases of leukemia are myelogenous in origin. In infants as in adults the acute variety is more apt to be of the lymphatic type. The disease is rare in early as well as in later life, but it is probably more common than has been supposed. Of the twenty-two cases of the acute or subacute variety, fifteen have been reported since 1898, while previous to that only seven cases were recorded. The course of the disease in children differs from the adult type only in minor details. The hemorrhages are fewer and less severe, and the lymphocytosis is more apt to be of the small variety. The disease is always fatal.

Treatment of Status Epilepticus.—A. M. Tremaine, A.M. (New York Medical Journal, Sept. 10, 1904).—Almost all of the patients who develop status die. The books state that if the temperature rises the gravity of the case deepens, and very soon it becomes hopeless. It is evident that if anything is to be done to save these patients it must be prompt and along heroic lines. The writer describes the treatment of two cases which recovered. The first was that of a girl of eleven years, who had since her third year suffered from epilepsy, having both the grand and petit mal attacks. At first they occurred about once a month, but later with more frequency, showing a tendency to group themselves in series. On the morning of the day when status developed she had five slight seizures. At 1.30 that afternoon the severe attacks began, she having nine altogether in fifty minutes. The left side of the body, face, arm and leg were involved in the order named. She did not regain consciousness during the attacks, and at 2.20 she was comatose. The heart's action was feeble. The temperature seventy minutes after the onset of the seizures was 101.8 degrees, the pulse 152, and respirations 37 to 39 per minute. At this time a hypodermic of apomorphine was given and a vein in the arm was opened. The amount of blood withdrawn was estimated at from 8 to 10 ounces. Normal salt solution was immediately injected into the veins, and an additional quantity introduced under the skin, and a quart of the same solution introduced into the rectum. Preceding the rectal injections 30 grains of potassium bromide and 20 grains of chloral hydrate were given by the rectum. A drachm of 50 per cent solution of potassium bromide was given as soon as the coma developed. These measures improved the general condition of the patient, though the pulse was weak and frequent, for which strychnine was given hypodermically. Ten to fifteen minutes after the introduction of the salt solution an appreciable change for the better was noticeable. The pulse grew stronger, the cyanosis disappeared, and the convulsions diminished. The latter ceased about a half-hour after beginning the treatment, making the duration of the status epilepticus about an hour. The patient remained in a semicomatose condition through the following night. Cold sponge baths and enemata were used to lower the temperature, which rose steadily until midnight, when it reached 100 degrees F. During the following day the temperature gradually fell to 99 degrees. On the second day following the status the reflexes were found to be normal, and on the third day the patient was up and about, though she was a little duller mentally than usual.

A second case was that of a high-grade imbecile aged ten years, who had been epileptic for three years. During the seven months preceding the attack she had had about twenty seizures a month, showing a tendency to occur in groups. After eight diurnal grand mal seizures a state of continuous unconsciousness ensued, together with rapidly recurring clonic convulsions preceded by short tonic spasms, which involved the left side of the face and arms, later involving the right arm. This condition lasted an hour. During the last twenty minutes of the time both lower extremities were involved in rapidly recurring tonic and clonic convulsions, while those of the upper extremity lessened in severity and finally ceased. During the hour the temperature rose rapidly to 104 degrees. Bromides and chloral hydrate were given by the rectum. Chloroform inhalations were begun at first and maintained for some time, but had very little effect. The median cephalic vein of the right arm was opened, and after the bleeding about a pint of normal salt solution was introduced. In fifteen minutes a marked diminution in the severity of the spasms was noted. A pint of salt solution was given by the rectum; finally the spasms ceased. The following day the patient was duller mentally, but was otherwise well.

The writer's experience confirms the value of intravenous saline injections in the treatment of status epilepticus. At the same time sedative medication of the most active sort should be employed.

Renal Retinitis in the Young.—E. Nettleship, F.R.C.S. (Royal London Ophthalmic Hospital Reports, Vol. XVI., Part I), has collected 80 cases of interstitial nephritis in patients not above the age of 21 years, including nine under his own care. In addition there were three cases in which the nephritis was associated with calculus in the kidney or bladder. Sixty-two cases were known to be fatal, and in 60 of these a necropsy was made. For purposes of comparison he examined the notes of 149 cases diagnosed as parenchymatous nephritis at the hospital for Sick Children, Great Ormond Street. Out of the 80 cases of intestinal nephritis retinitis or multiple retinal hemorrhage was observed in 31 and it also occurred in two out of the three cases associated with calculus. In ten the eyes were examined and found to be normal. In the remaining cases no ophthalmological examination appears to have been made. Out of the 149 cases of parenchymatous nephritis definite retinitis was found in seven, and doubtful appearances, such as slight haziness of the discs, in several others. In about 43 cases the eyes were examined and found to be normal, and in the remaining cases no examination appears to have been made. Of the 40 cases of retinitis in both groups both retinæ were detached in three cases, abundant hemorrhage was a feature in two or three, and exudation and swelling were excessive in three or four others. The earliest age at which renal retinitis has been recorded is five years (in a girl). In the 40 cases (interstitial and parenchymatous) the age of two patients was seven; of three, eight; of two, nine; of three, ten; of two, eleven; and of five, twelve years. Of the 40 patients suffering from retinitis, 24 died at a known period after the retinitis was discovered. The interval was three and one-half years in one case, between twelve and fifteen months in 4 cases, between four and seven months in three cases, and less than four months in 16 cases. Hence the prognosis of chronic renal disease with retinal changes in the young is not less grave, perhaps more grave, than in adults. Chronic renal disease below the age of twenty-one was found to be commoner in females than males, the reverse of the rule in adults. The females amounted to 64 and the males to 36 per cent. of the total. In interstitial nephritis the preponderence of females was still greater (70 per cent.). In parenchymatous nephritis, on the contrary, the males were slightly in excess of the females. But in the parenchymatous nephritis of adults the excess is much greater (according to Dickinson more than twice as many cases occur in males than females). As to the causation of interstitial nephritis in the young, out of 45 cases in which the previous history was complete, scarlet fever occurred before the onset of the renal symptoms in 16, the interval never being less than two years and often much more. In at least six cases scarlet fever was definitely denied. Measles, the most probable cause in eight cases. In two cases there was a history of chronic infantile eczema; in two of severe infantile diarrhea; and in one or two of rickets with subsequent arrest of growth and failure of intelligence. In three there was a history of stone in the kidney and bladder. In three cases alcohol presumably was the cause, two of the patients being lads who drank heavily and one a barmaid who owned to taking "neat" brandy before breakfast. Hereditary syphilis was proved in six cases and was highly probable in several others. It was also certainly the cause in four of the parenchymatous cases. Thus the specific fevers accounted for about three-quarters of the interstitial cases. They were evidently the cause of one-third of the parenchymatous cases, but this proportion was probably short of the true one.

BOOK REVIEWS

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by A. O. J. KELLY, A.M., M.D. Vols. I., II., 1904. J. B. Lippincott, Philadelphia.

The *International Clinics* still continues to maintain its wide applicability to the needs of the practising physician. Under the able editorship of Dr. Kelly the articles presented have shown a wider and more modern character, and with but few exceptions are from men of the highest standing.

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